The RUBBER AGE

January, 1943

DETROIT


# KALVAN AND KALITE

*

**Produce results reasonably like the soft carbons, i. e., P-33 and THERMAX.**

**The demand for those blacks now exceeds the available supply.**

**Consider, if you will, using more KALVAN and KALITE.**

***** *Ask for our laboratory folder*

**R. T. VANDERBILT CO., INC.**

**230 Park Avenue, New York City**

**Newsletter No. 1** *PUBLISHED BY RUBBER CHEMICALS DIVISION OF* DUPONT *JAN., 1943*

# Neoprene Latex Type 571 Can Be Used In All Production Processes

NEOPRENE LATEX TYPE 571 can be used to manufacture practically all types of products which are made from natural or other synthetic rubber latices. This type of neoprene latex is available on a commercial scale at this time. It is an alkaline dispersion of neoprene in water. It contains approximately 50% solids by weight, and is a milk white liquid having a specific gravity of 1.10.

Articles may be made from the compounded latex by spraying, dipping, electro-deposition, gelation or other types of molding, and fabrics and other fibrous materials may be spread, coated or impregnated with it.

SUPERIOR PRODUCTS—Neoprene Latex Type 571 may be mixed with compounding ingredients and processed in much the same manner as natural rubber latices. It will be used in the manufacture of critical parts necessary to the war effort. In addition to supplementing available supplies of rubber latex, the neoprene latex makes possible further savings of material by producing products which will have longer life under severe conditions of service.

Although Neoprene Latex Type 571 is somewhat less viscous than rubber latex of the same concentration, it may be readily thickened by the addition of relatively small quantities of various thickening agents. Methyl cellulose seems to be the most effective thickener. Casein, glue, bentonite, and various gums are much less effective thickeners.

DIPPED FILMS—Uncompounded and compounded Latex Type 571 can be made to wet glass and other smooth surfaces well by the incorporation of small quantities of a wetting agent such as AQUAREX SMO. Compounded latices containing such a material deposit smooth films that are somewhat tacky when almost dry but most of the tackiness disappears when the film is entirely dry. Films dried at room temperature are tough, elastic and have good tensile strength. However, as was the case with Neoprene Latex Type 57, vulcanization in air at elevated temperatures of the order of 140°C for 30 to 60 minutes is necessary to develop the optimum physical properties of the composition.

FILLERS—The most suitable filler for general use with Neoprene Latex Type 571 is hard clay. Lithopone which was recommended for use in Neoprene Latex Type 57 slightly retards the rate of cure of Type 571, and, therefore, should be avoided. The physical properties developed in a simple basic Neoprene Latex Type 571 stock containing ten parts by weight of clay in addition to ten parts of zinc oxide, two parts of NEOZONE D, 0.25 parts casein and 0.25 parts AQUAREX D are illustrated in the table below.

**PHYSICAL PROPERTIES OF FILMS FROM LATEX 571 BASIC COMPOUND**

| Air Cure Min./°C | Stress at 600% psi | Tensile Strength psi | Elong. at Break % |
|---|---|---|---|
| 0.140 | 500 | 3425 | 990 |
| 15.140 | 825 | 3850 | 920 |
| 30.140 | 850 | 3950 | 915 |
| 60.140 | 900 | 4275 | 910 |

In addition to clay other inert fillers such as whiting, blanc fixe, soft carbon black and barytes may be used in Neoprene Latex 571. However, none of these fillers has a reenforcing effect, and their use in increasing quantities results in vulcanizates which exhibit a steady decrease in tensile strength and increase in modulus, permanent set and hardness. Mixes containing semi-reenforcing carbon black have excellent stability but the vulcanizates have lower tensile strength and permanent set and higher modulus, hardness, tear and abrasion resistance than those containing soft carbon black. Reenforcing channel black imparts excellent physical properties to Type 571 vulcanizates, but because of its effect on the stabilization of the mix, its use should generally be restricted to less than ten parts by weight.

VULCANIZED PROPERTIES—Vulcanized films from Neoprene Latex Type 571 compounds are inherently resistant to oils and even after immersion for 48 hours at 100°C in kerosene will retain a large proportion of their original strength. A pure gum stock such as that made from the standard basic formula previously mentioned will have a volume increase of approximately 95% under these conditions. The volume increase of loaded compounds containing fillers and oils will be less. Cured films from neoprene latex compounds containing one to two parts of a good antioxidant such as NEOZONE D are unusually resistant to the deteriorating influences of heat, light, oxygen and ozone. Such films appear to be in a usable condition after exposure for 100 days in the oxygen bomb. (Oxygen at 70°C at 300 psi pressure) or 400 hours in the Fade-O-Meter. The electrical properties of neoprene latex films have not yet been fully determined, but indications are that they will be suitable for use as insulation for low voltage applications. Because of the resistance of neoprene to ozone, aging, oils and flame, the overall quality and life of rubber insulation on wire may be improved by giving it two dips in a neoprene latex composition. The manufacture of a wide variety of products from neoprene latex Type 571 has been investigated, and we are in a position to recommend Type 571 compounds for use in the manufacture of many products using dip processes, gelation molding processes, and various procedures for applying protective coatings. Our Latex Laboratory is at your service, and is awaiting any opportunity to cooperate in solving any problem you may have concerning the use of Neoprene Latex Type 571.

## *Through the Mill*

NEOPRENE LATEX *and other water dispersions such as the dispersed latex chemicals and color pastes will freeze if exposed for too long a time to excessively cold temperatures. As freezing usually breaks the dispersion, making the product unsuitable for use, we will ship these products by express throughout the winter months unless the customer signifies his willingness to accept responsibility for any damage that may occur due to freezing in transit.*

*The following products are included in this category:*

*Neoprene Latex Type 571*
*Neoprene Latex Type 60*
*Dispersed Antox*
*Dispersed Heliozone*
*Rubber Monastral Fast Blue PCD Paste*
*Rubber Monastral Fast Green GSD Paste*

COMPOUND CARDS *are readily smeared and unless protected will soon be so dirty that they are practically useless. Application of a clear lacquer effectively protects compound cards as any soiled spots may be easily removed by wiping with a damp cloth. An excellent protectant is du Pont Gloss Paper Lacquer No. 1395. Inquiries regarding this material should be addressed to:*

*Finishes Division*
*Fabrics & Finishes Dept.*
*E. I. du Pont de Nemours & Co., Inc.*
*Wilmington, Del.*

BUNA S *Report No. 42-4 entitled, "The Compounding of Buna S" is fresh from the press and is available to the technical staffs of all rubber manufacturers. If you did not receive a copy of this report covering the principles of compounding Buna S, with emphasis on acceleration, ask for a copy on your company letterhead.*

# RUBBER CHEMICALS DIVISION

*Wilmington* DUPONT *Delaware*

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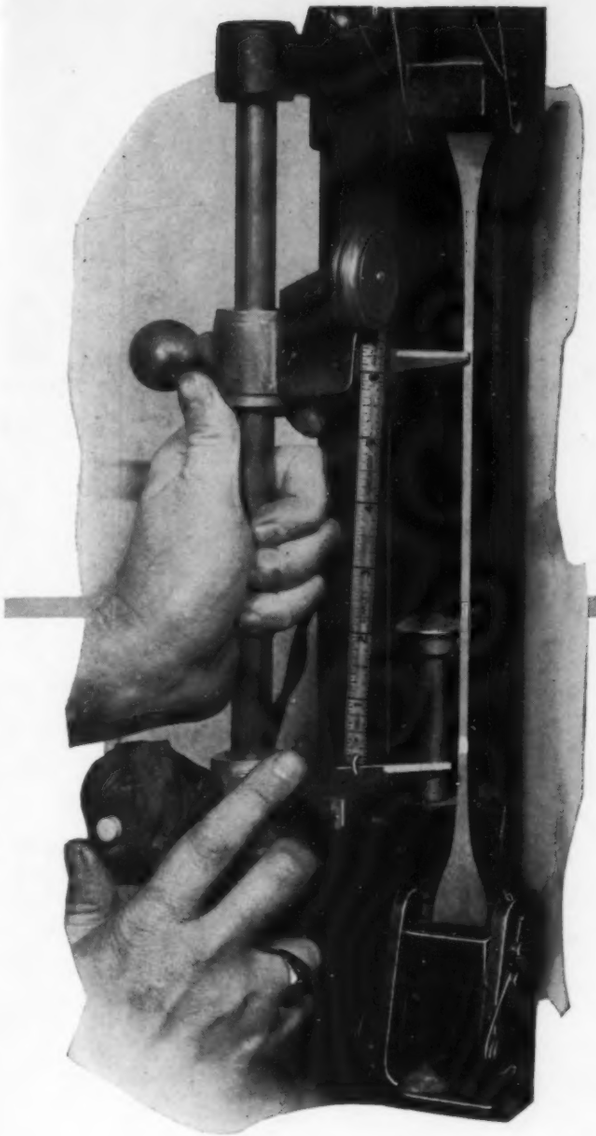


# Picture of some HYCAR coming down the stretch

Determining certain physical properties of rubber by means of the tensile tester is an operation familiar to most rubber men. But perhaps somewhat less familiar is the fact that from our Customer Service laboratory now are coming some Hycar compounds which as a matter of course meet not only elongation but *tensile* tests that only a few months back would have been considered pretty strenuous.

The standard test strip, or "dumb-bell", pictured here shows 500% elongation, a stretch that's commonplace enough today, but one that for this particular type of stock would have been a major achievement less than a year ago without sacrificing tensile, or other desirable characteristics. Because tensile was actually improved rather than impaired, we believe this example is an unspectacular but practical illustration of the kind of benefits rubber fabricators can realize when they bring their products and problems in synthetic rubber to the Hycar Customer Service laboratory for development.

Our complete facilities, technical help and experience are at your disposal. We urge you to make full use of them.

HYCAR CHEMICAL COMPANY, *Akron, Ohio*

**HYCAR** *Synthetic* **Rubber**

*LARGEST INDEPENDENT PRODUCER IN AMERICA OF BUTADIENE SYNTHETIC RUBBER*

# *No Time to Lose*

In these days consumers of zinc oxides find no allowances in production schedules for wasted time. Realizing this, they are more exacting in the purchase of raw materials; when ordering zinc oxides, they specify ST. JOE Lead-Free ZINC OXIDES; the reputation behind this name is the best insurance for *consistent* quality.

ST. JOSEPH LEAD COMPANY

250 PARK AVE., NEW YORK, N. Y.

*MADE BY THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES*

# 100% VULCANIZABLE HYDROCARBON BASE

NAFTOLEN is of an unsaturated hydrocarbon nature. Thus NAFTOLEN plus rubber (natural or synthetic) should be considered as the vulcanizable hydrocarbon base of the compound. Behavior during cure can be depicted as a covulcanization of the NAFTOLEN hydrocarbon with the rubber hydrocarbon.

**WILMINGTON CHEMICAL CORPORATION**
**10 East 40th Street · New York, N. Y.**
***Plant and Laboratory: Wilmington, Delaware***

# GASTEX and PELLETEX On Every Front

In Army and Navy, in stratosphere and ocean depths, GASTEX and PELLETEX Semi-Reenforcing Blacks are serving our country—and through lend lease our allies—in hundreds of compounds; in thousands of fabrications. We predict that first hand lessons gained through the harshest of war uses and necessary abuses in service will enable those on the home front—in laboratory and designing room—to quickly adapt these semi-reenforcing pigments for expanded civilian service after Victory to the benefit of a more enlightened world.

Our technical staff is at your service in shaping these developments.

## HERRON BROS. & MEYER

**OHIO BLDG., AKRON, OHIO.**

GASTEX TRADE MARK

GENERAL SALES AGENTS FOR

**GENERAL ATLAS CARBON DIVISION**

OF GENERAL PROPERTIES COMPANY, INC.

**PAMPA, TEXAS — GUYMON, OKLA.**

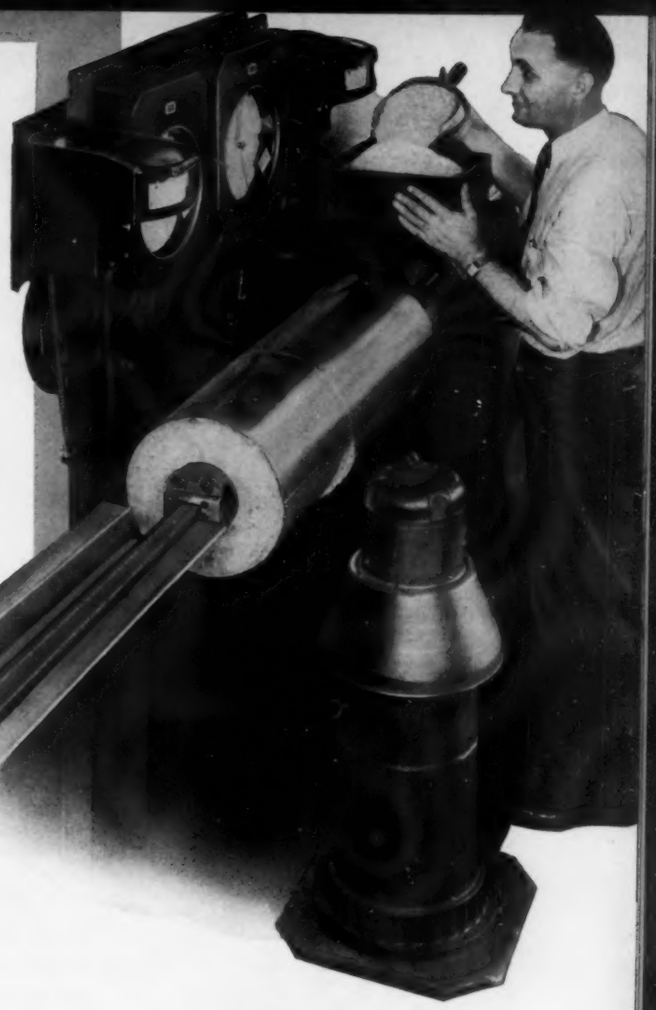
PELLETEX TRADE MARK

DISTRICT SALES AGENTS

ERNEST JACOBY & CO., Boston
HERRON BROS. & MEYER, New York
THE C. P. HALL CO. OF CALIF., Los Angeles
HERRON & MEYER, Chicago
H. M. ROYAL, INC., Trenton, N. J.
ST. LAWRENCE CHEMICAL CO., LTD., Toronto - Montreal

# Extrusion

## THE NEW PROCESS THAT'S BUILT ON BED-ROCK



SPEED, economy and simplicity—these are the three big advantages the extrusion process brought to the rubber industry, the copper and brass industry, the aluminum industry, and others.

Three years ago National's engineers and chemists began a long series of studies and tests aimed at bringing these advantages in practical, useful form to the plastics industry. Endless experiments with raw materials of all kinds in actual trial runs through National's modern Pilot Plant developed one basic fact—that there can be no "jack-of-all-trades" in plastics extruders. For true efficiency a plastics extruder must be built for the job.

By designing and building extrusion machines for the specific job (the product and the material to make it) they achieved the advantages they sought—speed, economy and simplicity—and found further that practically every thermoplastic can be extruded efficiently and at lower cost.

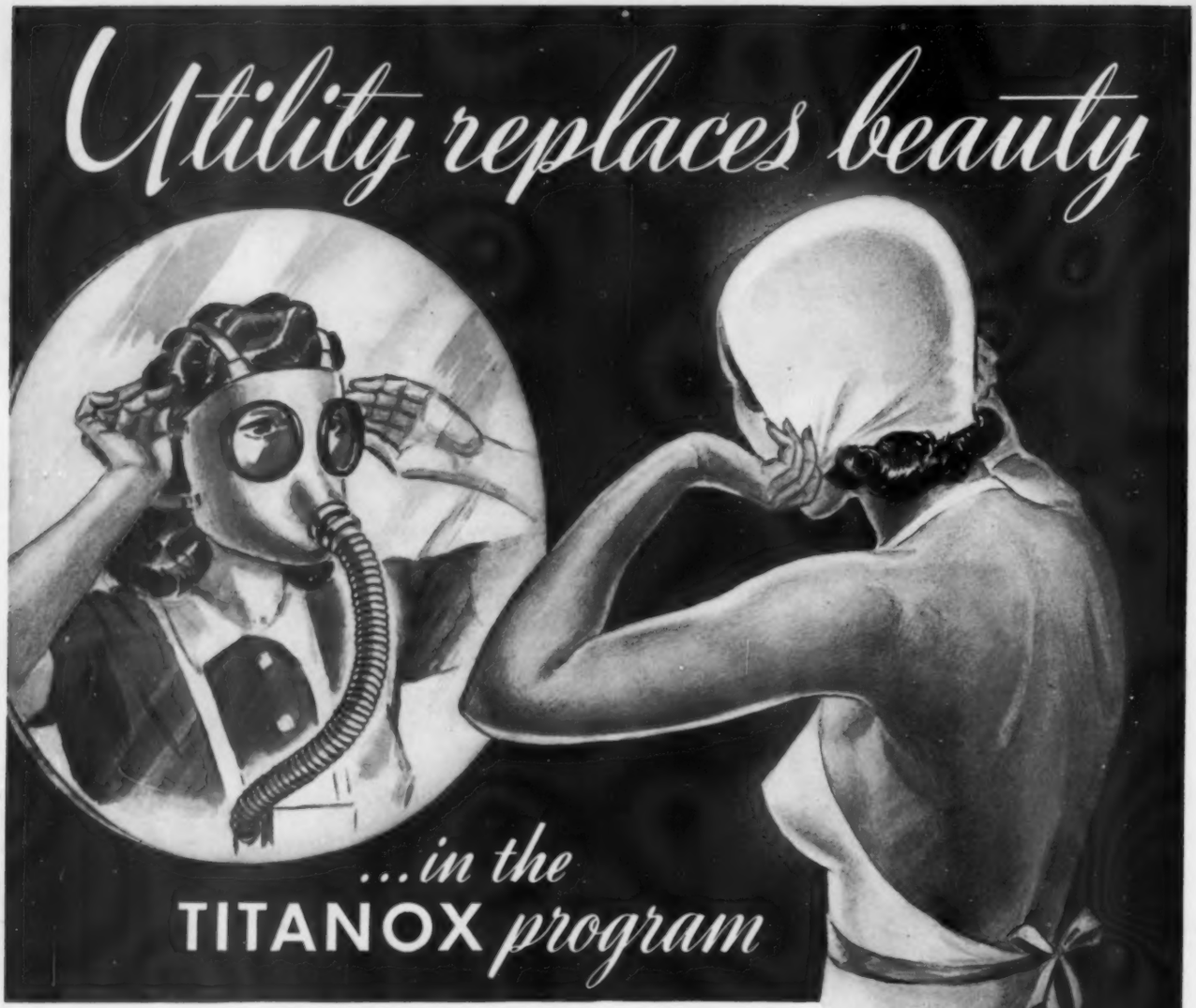
Because thorough engineering is the very basis of every machine we build, National's position of leadership has never been challenged. There are more National extruders in operation today than all other makes combined.

The use of plastics extruders has increased over 300% in the last 12 months alone. It will continue to grow as more farsighted manufacturers recognize the opportunities in the process and the need for machines built for the job.

**NATIONAL RUBBER MACHINERY COMPANY**

*General Offices:* AKRON, OHIO

*CREATIVE ENGINEERING*




JUST as TITANOX pigments give whiteness and brightness to natural and reclaimed rubber, so they do to synthetics.

However, utility is now the keynote of the National Rubber Program. In cooperation, the entire efforts of the TITANOX Rubber Laboratory are devoted to the development of superior physical properties of synthetic rubber.

We will gladly join forces with technical men in the tire and rubber fields in this work whether or not TITANOX pigments are involved.

**TITANIUM PIGMENT CORPORATION**
SOLE SALES AGENT
111 B'way, New York, N. Y. • 104 South Michigan Avenue, Chicago, Illinois • 350 Townsend Street, San Francisco, California
2472 Enterprise Street, Los Angeles, Calif.

TITANOX
REG. U.S. PAT. OFF.

# TITANOX
TRADE MARK

# SUN RUBBER PROCESSING OIL

## Provides Needed Life and Flexibility in Aircraft Parts

The performance . . . the very life . . . of a warplane depends upon the proper functioning of hundreds of small rubber and synthetic rubber parts. Tubing, gaskets, seals, couplings, fuel cells are but a few of the vital parts of a modern airplane, made of rubber and synthetics, that *must* stand up under the most severe flying conditions. Circo Light Processing Oil is helping many manufacturers of these essential parts to secure the needed physical properties.

One rubber company had experienced great difficulty in obtaining the softness and flexibility required for aircraft service. Following exhaustive tests, this company has standardized on Circo Light Processing Oil in its formulas, because this is the only plasticizer which they could find to provide these qualities. Circo Light also proved highly compatible with the rubbers used in their compounds . . . and *reduced milling time 15 %!*

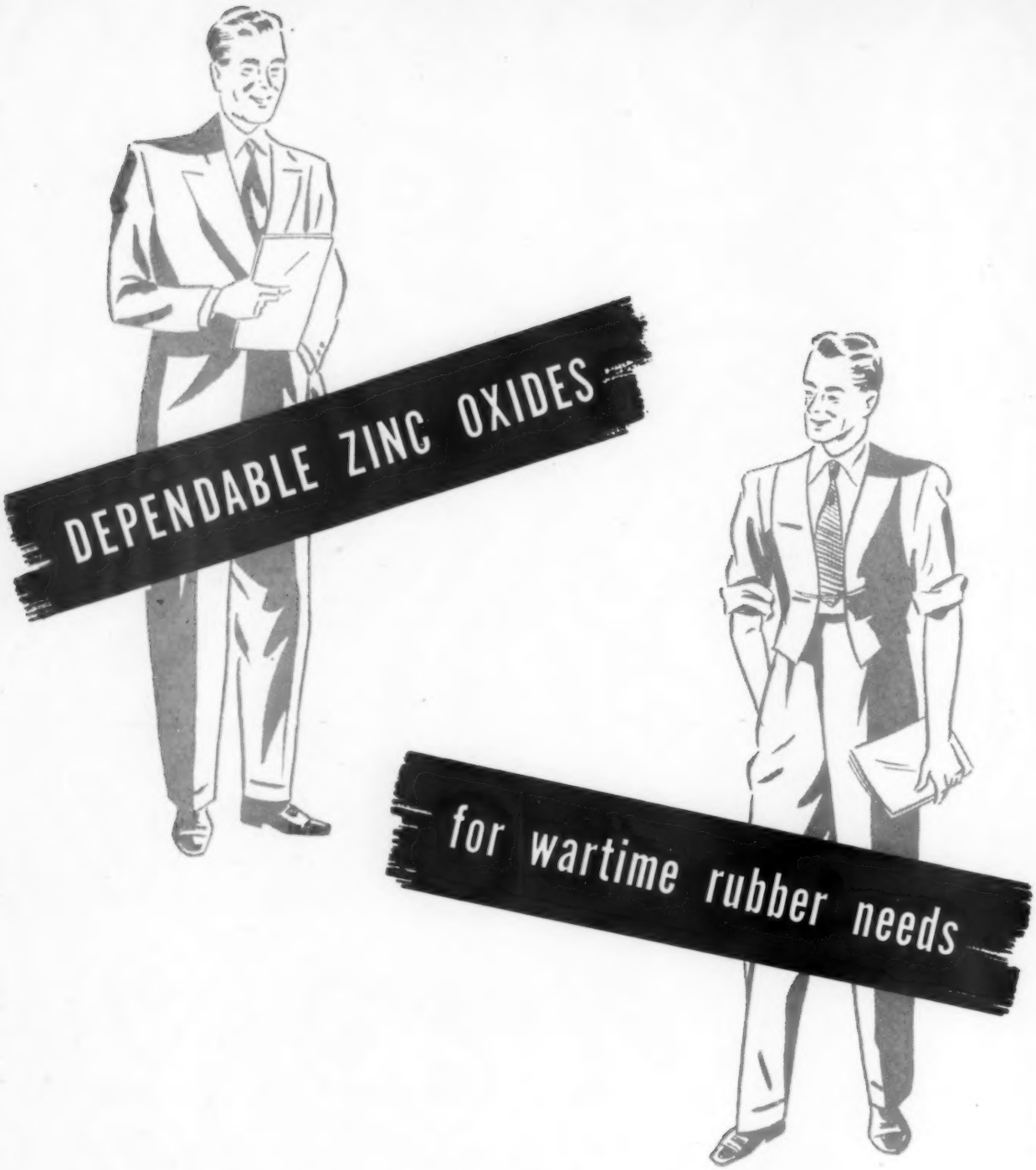
Circo Light has helped many rubber manufacturers to secure and maintain desired physical properties . . . to reduce cost of compounding . . . to speed-up production. Call in a Sun Oil Engineer . . . one of those capable Doctors of Industry . . . and let him show you how to secure such results. Write . . .

**SUN OIL COMPANY, *Philadelphia***

*Sun Oil Company, Limited . . . Toronto, Canada*

SUNOCO

# SUN PETROLEUM PRODUCTS *HELPING INDUSTRY HELP AMERICA*




# AZO

ZINC OXIDES

**AMERICAN ZINC SALES CO., Distributors for AMERICAN ZINC, LEAD & SMELTING CO.**

COLUMBUS, OHIO - CHICAGO - ST. LOUIS - NEW YORK

# CHANGE OVER TO

# Continental "AA" CARBON BLACK

## FOR LESS HEAT GENERATION IN ALL TIRE FORMULATIONS

### IT'S EASIER PROCESSING, TOO—

### TRY IT IN YOUR BUNA S FORMULATIONS

Continental "AA" is already being successfully used in the Buna S formulations of leading manufacturers. Now is the time to investigate the characteristics of this new type black. Our Technical Staff will gladly work with you in adapting Continental "AA" to your particular requirements. May we send you samples for your experiments?

### ONE OF THESE GRADES IS YOUR BLACK

**CONTINENTAL "AA"**—Low heat generating—easy processing
**CONTINENTAL A**—Medium cure—medium processing
**CONTINENTAL C**—Standard
**CONTINENTAL F**—Slow cure—hard processing
**CONTINENTAL C-15**—Low conductivity

Continental CARBON COMPANY

295 MADISON AVENUE • NEW YORK, N. Y.

Akron Sales Office: Peoples Bank Building, Akron, Ohio • SALES REPRESENTATIVES: Ernest Jacoby & Co., Boston, Mass. • Marshall Dill, Los Angeles and San Francisco, Calif.

A Bright Omen
FOR 1943
When American troops landed in Africa in November,
a magnificent rainbow arched the sky.
SEASON'S
GREETINGS
To our many friends we extend the season's greetings and sincere wishes of good cheer.
It is our hope and prayer that under the guidance of Divine Providence, victory may soon bring true and lasting peace to our beloved country.
HERMAN MUEHLSTEIN
President
H. MUEHLSTEIN & Co. INC.

# PICCOLYTE *is back!*

## *- - - after serving with distinction our Government needs.*

**This outstanding hydrocarbon terpene resin went to war. For months its use has been restricted. NOW it has been released, and in unlimited quantities, for the many other uses its distinctive properties will encourage.**

PICCOLYTE Resin is an extender for Synthetic, Natural, Reclaimed rubber and Latex, possessing properties that definitely improve the resulting compound . . . It is soluble in petroleum oils; compatible with paraffins, waxes, coal tar resins, petroleum tar residues and pitches . . . It is compatible with rubber, Vistanex and Gutta Percha. It is resistant to alkalies and acids. It readily emulsifies for use with Latex and aqueous solutions.

PICCOLYTE Resins are available in a complete range of melting points which adapt them to various uses. They are non-toxic, making them useful in the food-container field as sealing and binding agents. They provide excellent adhesive properties for electrical and masking tapes. Their water-proofing properties recommend them for coating operations. They will serve effectively as tank linings. No single resinous product offers as wide a range of uses and adaptations. *It is low in cost, too.*

*Write, wire or phone us immediately for samples and complete data.*

# STANDARD
## *Chemical Company*

AKRON SAVINGS AND LOAN BLDG. AKRON, OHIO

# WE ARE SERVING UNCLE SAM

Operating under the direct control and supervision of the Rubber Reserve Co. — a Federal agency — in the purchase and handling of scrap rubber, we are loaning our experience and organization to the promotion of the war effort and have ceased to operate on our own account for the period of the emergency.

We are honored in having this opportunity to do our part in helping to overcome the rubber shortage.

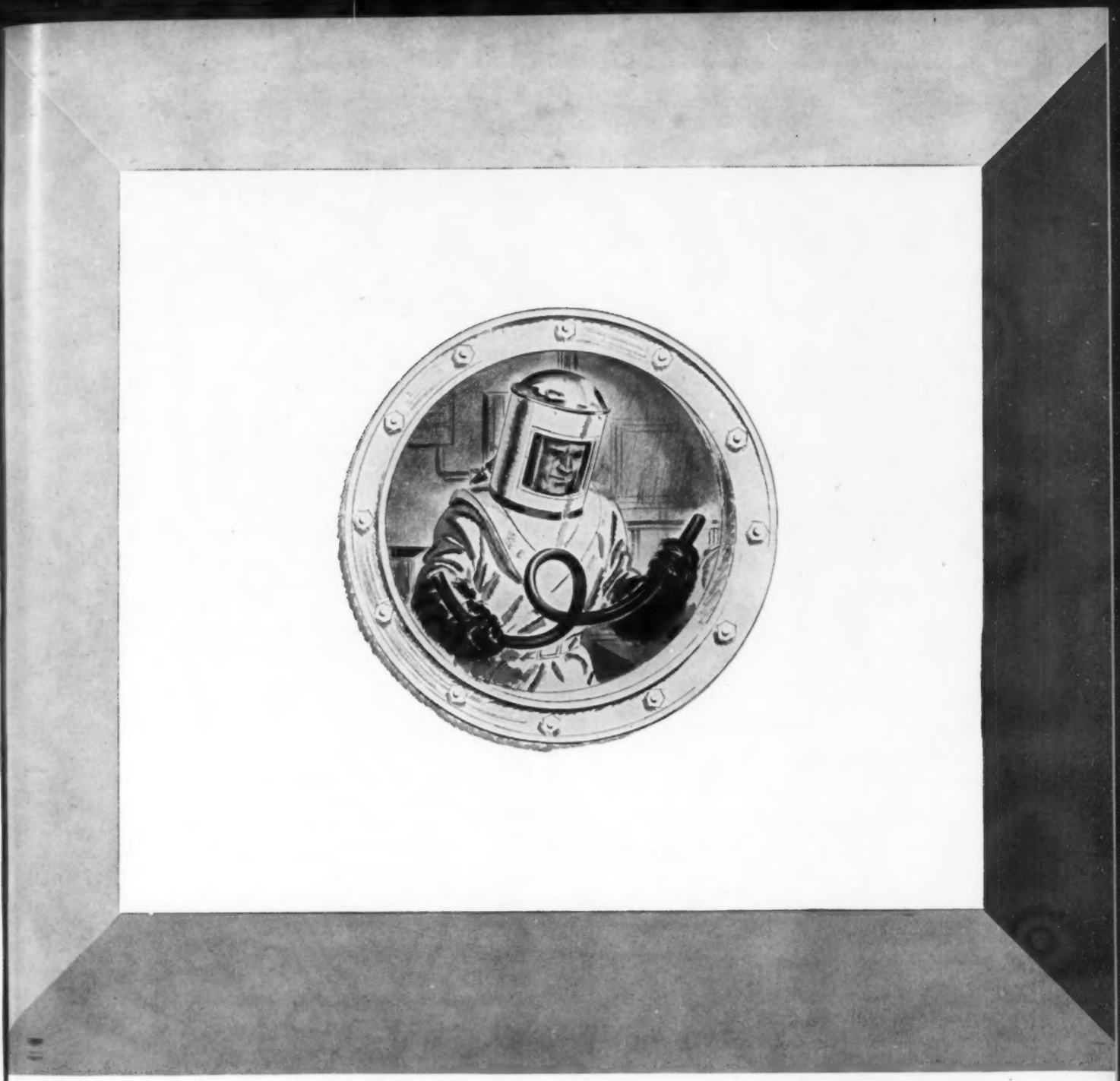
*Serving the Trade since 1868*

## THE LOEWENTHAL CO.

***Buying Agent, Rubber Reserve Company***

188 W. RANDOLPH ST.
CHICAGO, ILL.

159 CLEWELL ST.
AKRON, OHIO



# Flexible . . . at 70° below

THERE are very few rubber-like materials that retain their flexibility at 70° below zero. One of them is Thiokol* synthetic rubber. In fact, "Thiokol" stocks have been compounded that remain flexible at temperatures as low as minus 85° F. And our research laboratory expects to develop stocks that will be flexible at temperatures as low as minus 100° F.

The Thiokol Corporation laboratories have amassed much interesting test data on synthetic rubber at very low temperatures. This, added to a wealth of information on Thiokol's oil-proofness, flexibility, durability and resistance to gases under pressure, puts Thiokol Corporation in a unique position to help you with your war-product problems.

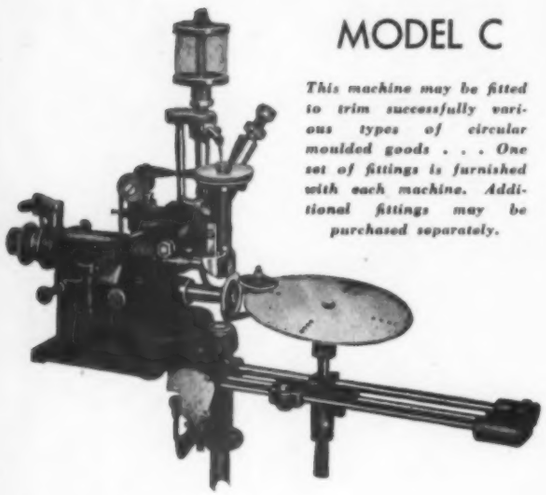
For complete technical data, write:
*Thiokol Corporation, Trenton, New Jersey*

Thiokol*
SYNTHETIC RUBBER
*"America's First"*

*Thiokol Corporation trade-mark, Reg. U. S. Pat. Off.

# USMC TRIMMING MACHINE

## MODEL C

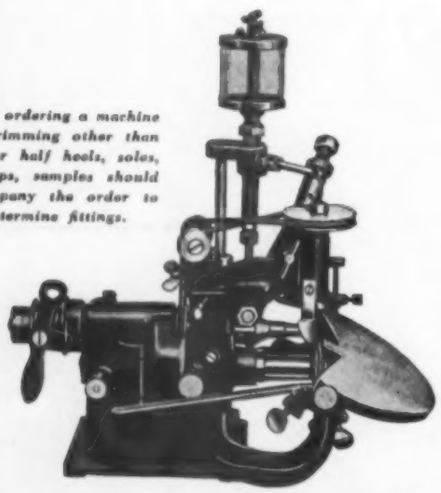


*This machine may be fitted to trim successfully various types of circular moulded goods . . . One set of fittings is furnished with each machine. Additional fittings may be purchased separately.*

A new and improved machine for trimming the overflow on all types of moulded rubber heels, soles, taps, and miscellaneous moulded rubber goods of similar construction.

Oil is the standard means of lubrication. A water tank is shipped, only when specifically ordered, at an extra charge.

*When ordering a machine for trimming other than regular half heels, soles, or taps, samples should accompany the order to determine fittings.*



**UNITED SHOE MACHINERY CORPORATION**

140 Federal Street, Boston, Mass.

Auburn, Maine..38 Minot Ave.
Brockton, Mass.....93 Centre
Chicago, Ill...800 So. Franklin
Cincinnati, O...407 East Eighth
Harrisburg, Pa...20 So. Fourth
Haverhill, Mass.....145 Essex
Johnson City, N. Y.
19 Jennison Ave.
Lynn, Mass.....525 Union
Milwaukee, Wis...922 N. Fourth
Nashville, Tenn., 901 Church St.
New York, N. Y., 110 Fifth Ave.
Philadelphia, Pa., 221 No. 13th
Rochester, N. Y.
60 Commercial St.
St. Louis, Mo.
2200 Washington Ave.
San Francisco, Cal., 859 Mission
Worcester, Mass....71 Mechanic



# *Improve the tack* WITH

# CRYSTEX insoluble SULPHUR

Crystex, an amorphous sulphur, improves the tack by preventing bin-cure and dryness which usually occur when a high percentage reclaim compound is used.

Crystex prevents bloom in uncured rubber stocks. It does not dissolve in rubber but will "stay put" at temperatures usually prevailing during storage periods. Crystex is of outstanding value when employed in the manufacture of stocks to be used for repair materials, in retread stocks, valve-patch frictions, and other products.

The characteristics of Crystex indicate that further uses may be found for this product in the rubber making industry.

**OTHER RUBBERMAKERS' CHEMICALS**

Commercial Rubbermakers' Sulphur, Tire Brand, 99½% Pure
Refined Rubbermakers' Sulphur, Tube Brand, 100% Pure
Carbon Tetrachloride, Carbon Bisulphide
Caustic Soda, Sulphur Chloride

Stauffer CHEMICALS SINCE 1885

**STAUFFER CHEMICAL CO.**

420 LEXINGTON AVE., NEW YORK, N. Y.
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624 CALIFORNIA ST., SAN FRANCISCO, CAL.
555 SO. FLOWER ST., LOS ANGELES, CAL.
424 OHIO BUILDING, AKRON, OHIO
NORTH PORTLAND, OREGON
HOUSTON, TEXAS, APOPKA, FLORIDA

# -Reduce Your Rubber Waste

## *Wasting Rubber Is An Extravagance Which We Can Ill Afford Today*

ONE form of waste in the rubber industry which can be easily prevented is that which occurs when rubber stocks stick to untreated liners. This usually results in a waste of some of the rubber and a loss of time, effort and materials when the rubber has to be stripped from the liner and reworked.

The solution to this problem is to use liners treated by the *Capitol Process* — the economical and efficient method which renders cotton piece goods repellent to adhesion of rubber stocks and prolongs the life of the fabric at a low cost.

Send us a fifty or one hundred yard liner and we will give it our CAPITOL LINER TREATMENT without charge, that you may test it in the plant. The all-around savings in rubber stocks and cotton piece goods will be most gratifying.

## TEXTILE PROOFERS, Inc.

**One Gates Ave., Jersey City, N. J.**

# ★ PLASTAC

USED IN BUTADIENE SYNTHETIC RUBBER

*Produces...*

★ PLASTAC is an easy-to-handle liquid, non-fuming, non-retarding, and inexpensive.

Its plasticizing action makes it excellent for processing.

FOR SAMPLES, DATA, AND PRICES WRITE:

**ADVANCE SOLVENTS & CHEMICAL CORPORATION**
245 FIFTH AVENUE · NEW YORK, N. Y.

*Rubber Makers Velvet—*

# "RMV" LAMP BLACK

IS A STRUCTURE CARBON

THIS means that Lamp Black produces firm uncured stocks which process smoothly and do not sag. Cured articles will exhibit good modulus in combination with high resilience.

●

**RMV Lamp Black is the ideal alternate for semi-reinforcing gas carbons.**

*Consult our Technical Service Department for samples and compounding suggestions.*

# LAMP BLACKS

With a record of more than 90 years for excellence

**THE L. MARTIN COMPANY, INC.**
UNIT OF COLUMBIAN CARBON CO.
Largest manufacturers of high grade lamp black in the world

**BINNEY & SMITH CO.**
DISTRIBUTOR OF RUBBER BLACKS
41 East 42nd Street, New York, N.Y.

● Synthetic rubber... with unusual resistance to oil

● ...with exceptional resistance to heat and cold

● ...with notable longevity.

# PERBUNAN

Write STANCO DISTRIBUTORS, INC.
26 Broadway, New York City
Warehouse stocks in New Jersey, Louisiana and California

**PERBUNAN** is available in amounts up to 200 pounds per month for certain types of experimental work. All other allocations of Perbunan synthetic rubber are now made by the Rubber and Rubber Products Branch of the War Production Board.

PERBUNAN

# Three types of CALCINED MAGNESIA for neoprene

WHITTAKER
ESTABLISHED 1890

**These three types of calcined magnesia meet requirements of quality and cost:**

- **LIGHT**—The highest type. For the most exacting compounds. Fine particle size. Low moisture and carbonate content.
- **MEDIUM**—For less exacting requirements and where costs must be kept down. Fine particle size and low moisture content.
- **HEAVY**—Meets low cost need where high type compounding is not essential.

***Samples, prices and additional information on request***

**WHITTAKER, CLARK & DANIELS, Inc.**
**260 West Broadway, New York City · Plant, South Kearney, N. J.**
**SALES REPRESENTATIVES**

*Chicago:* Harry Holland & Sons
*Philadelphia:* Peltz & Company
*Toronto:* Richardson Agencies, Ltd.
*Cleveland:* Palmer Schuster Company

# LATEX

**· NORMAL · CONCENTRATED · PROCESSED**

**Rubber Reserve permits promptly executed.**
**All types of latex compounded to meet customer's individual requirements.**
**Aqueous dispersions of reclaimed rubber.**
**Latex extenders.**
**Substitutes for latex and for latex adhesives.**

*Write us for further information, stating your specific problem.*

Trade Mark

# HEVEATEX CORPORATION

78 GOODYEAR AVE. MELROSE, MASS.

Trade Mark

NEW YORK, N. Y. • CHICAGO, ILL. • AKRON, OHIO

# FOR VICTORY TODAY AND SOUND BUSINESS TOMORROW

## *Get This Flag Flying Now!*

This War Savings Flag which flies today over companies, large and small, all across the land means *business.* It means, first, that 10% of the company's gross pay roll is being invested in War Bonds by the workers voluntarily.

It also means that the employees of all these companies are doing their part for Victory . . . by helping to buy the guns, tanks, and planes that America and her allies *must* have to win.

It means that billions of dollars are being diverted from "bidding" for the constantly shrinking stock of goods available, thus putting a brake on inflation. And it means that billions of dollars will be held in readiness for post-war readjustment.

Think what 10% of the national income, saved in War Bonds now, month after month, can buy when the war ends!

For Victory today . . . and prosperity *tomorrow,* keep the War Bond Pay-roll Savings Plan rolling in *your* firm. Get that flag flying now! Your State War Savings Staff Administrator will gladly explain how you may do so.

If your firm has not already installed the Payroll Savings Plan, *now is the time to do so.* For full details, plus samples of result-getting literature and promotional helps, write or wire: War Savings Staff, Section F, Treasury Department, 709 Twelfth Street NW., Washington, D. C.

EVERYBODY EVERY PAYDAY AT LEAST 10%

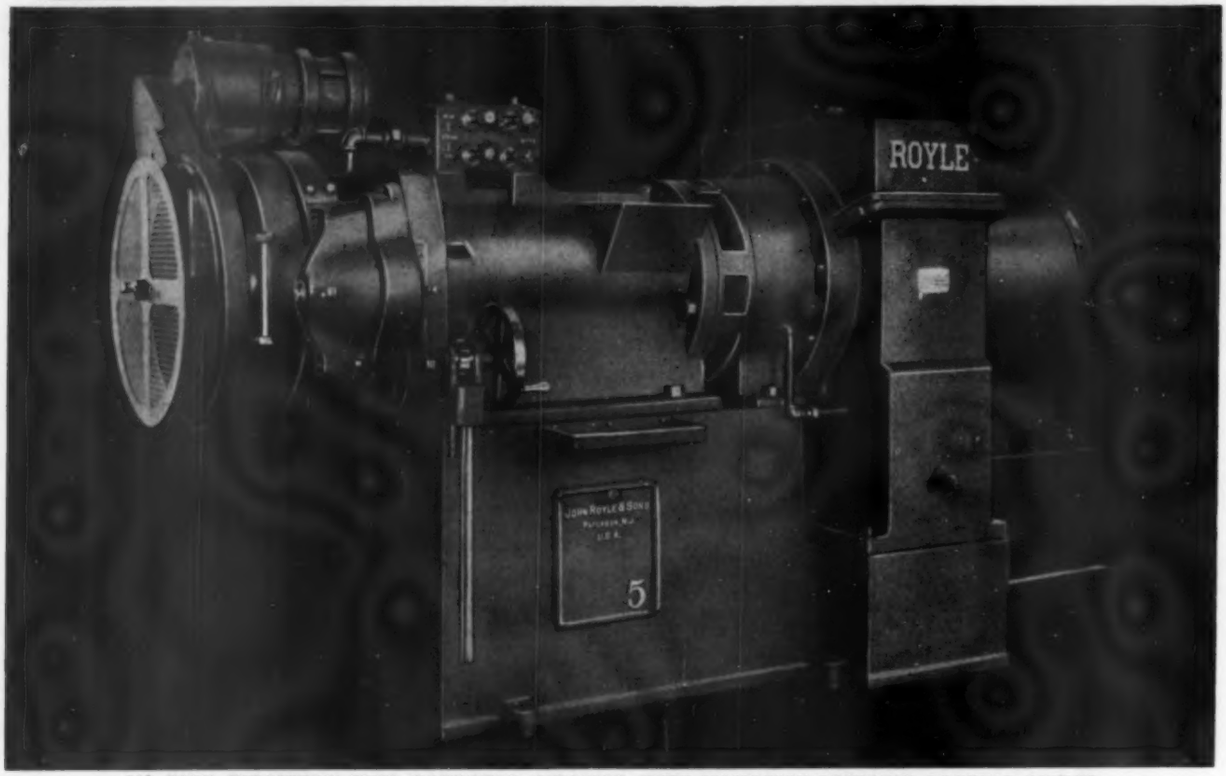
Save With

**War Savings Bonds**

This Space Is a Contribution to America's All-Out War Program by

THE RUBBER AGE

# TIMES *have* CHANGED

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# FACTS YOU SHOULD KNOW ABOUT COMPOUNDING

# GR-S★

- **GR-S** may be mixed with natural or reclaimed rubber in all proportions to give serviceable compounds.
- **GR-S** may be cured over a wide temperature range (20 to 75 lbs. steam) to obtain satisfactory products.

More than one type of accelerator may be needed to obtain the best results. Accelerators of the right type are available in the NAUGATUCK CHEMICAL line.

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The RUBBER AGE

VOL. 52, No. 4 JANUARY, 1943

# Standard Methods of Compound Evaluation and for Reporting Test Data on GR-S Tires

*The Office of the Rubber Director, as part of its duties, is correlating and disseminating as much information as possible on the compounding of the synthetic rubbers and rubber-like materials. All manufacturers in the rubber and allied fields are urged to report the results of any tests made on such materials. In order for the technologists to more conveniently and accurately correlate and evaluate test data as received from manufacturers and testing laboratories, a request has been issued that all test reports be submitted in a definite, recommended manner, as reproduced herewith.—Editor.*

## I. Laboratory Press Cures

All laboratory test data will be reported on the basis of cures made at or calculated to 280° F. Where it is not convenient nor desirable for a laboratory to cure at this temperature, then the equivalent time at 280°F. will be determined by means of the following table (see top of next page) which has been calculated from the formula:

$$\frac{t_1}{t_2} = K \frac{T_2 - T_1}{10}$$

where $t_1$ and $t_2$ are the times, and $T_1$ and $T_2$ are the temperatures. K = 1.43 where temperatures are in degrees Fahrenheit.

*Example No. 1*

It is desired to convert 60 minutes at 292°F. to the equivalent time at 280°F. Answer: 60 × 1.54 = 92 minutes.

*Example No. 2*

It is desired to convert 90 minutes at 274°F. to the equivalent time at 280°F. Answer: 90 × 0.81 = 73 minutes.

In tabulating physical test data the cures will be listed as though made at 280°F., with the actual curing times and temperature shown parenthetically, so that the record may be completely accurate.

Due to the wide range in curing rates of various GR-S compounds no arbitrary curing times are specified, but it is requested that each laboratory report data at optimum cure and in addition at least one overcure and one undercure.

TABLE FOR CALCULATING CURING TIMES IN TERMS OF 280°F.

| Temp. Used | 0° | 1° | 2° | 3° | 4° | 5° | 6° | 7° | 8° | 9° |
|---|---|---|---|---|---|---|---|---|---|---|
| 240° F. | .24 | .25 | .26 | .27 | .28 | .29 | .30 | .31 | .32 | .33 |
| 250° F. | .34 | .35 | .37 | .38 | .39 | .41 | .42 | .44 | .46 | .47 |
| 260° F. | .49 | .51 | .53 | .54 | .56 | .59 | .61 | .63 | .65 | .68 |
| 270° F. | .70 | .73 | .75 | .78 | .81 | .84 | .87 | .90 | .93 | .97 |
| 280° F. | 1.00 | 1.04 | 1.07 | 1.11 | 1.15 | 1.20 | 1.24 | 1.28 | 1.33 | 1.38 |
| 290° F. | 1.43 | 1.48 | 1.54 | 1.59 | 1.65 | 1.71 | 1.77 | 1.84 | 1.90 | 1.97 |
| 300° F. | 2.05 | 2.12 | 2.20 | 2.28 | 2.36 | 2.45 | 2.54 | 2.63 | 2.72 | 2.82 |
| 310° F. | 2.92 | 3.03 | 3.14 | 3.25 | 3.37 | 3.49 | 3.62 | 3.75 | 3.89 | 4.03 |
| 320° F. | 4.18 | 4.33 | 4.49 | 4.65 | 4.82 | 5.00 | 5.18 | 5.37 | 5.57 | 5.77 |

## II. Physical Tests

A. *Tensile Tests:* Load in pounds per square inch at 300 per cent elongation, ultimate tensile strength and percentage ultimate elongation will be reported together with comparative data obtained on the same cures made on the standard test formula given on page 111-2 of the WPB general release dated September 1, 1942. For convenience this formula is repeated here.

WPB STANDARD TEST FORMULA

| | |
|---|---|
| GR-S | 100 |
| Bardol | 5 |
| Zinc Oxide | 5 |
| Channel Black (Easy Processing) | 50 |
| Sulfur | 2 |
| Mercaptobenzothiazole | 1.5 |
| | 163.5 |

The standard compound should be mixed in the same manner and from the same lot of GR-S and preferably cured at the same time as the experimental compound.

B. *Mechanical Efficiency, Resilience and Related Properties:* The method used must depend upon laboratory equipment available. Reports must have complete identification of equipment used and conditions of operation. To simplify interpretation of results, figures should be reported in terms of percentage of the control, which again should be the WPB standard test formula given above. Thus if a resilience figure is obtained as in rebound this percentage will be the ratio of the experimental resilience over the control resilience multiplied by 100.

*Example No. 1*

Experimental resilience = 60 per cent
Standard resilience = 40 per cent
Final per cent reported = $\frac{60}{40} \times 100 = 150\%$

Where the torsional pendulum test is used the final percentage will be the inverse ratio of the hysteresis losses (logarithmic decrements) multiplied by 100.

*Example No. 2*

Experimental hysteresis = 0.200
Standard hysteresis = 0.300
Final per cent reported = $\frac{.300}{.200} \times 100 = 150\%$

Where heat build-up measurements are made the reported figure will be the inverse ratio of the temperature rises multiplied by 100.

*Example No. 3*

Experimental temp. rise = 100°F.
Standard temp. rise = 150°F.
Final per cent reported = $\frac{150}{100} \times 100 = 150\%$

C. *Resistance to Cut Growth:* The laboratories will continue to use available equipment (if any), and will make clear-cut identification of the equipment used, and the nature of the cuts made in the surface of the stocks at the grooves. Here again results will be reported in terms of per cent of the WPB standard compound.

D. *Tear Resistance:* Each laboratory will continue to use the tear test which it has been using, whether hand or machine tear, being careful to make clear the method and conditions used, and to report in terms of the WPB standard compound.

E. *Shore Hardness:* The Shore gauge should be kept in repair and calibrated regularly, and hardness figures reported in comparison with the WPB standard. Readings are taken after 30 seconds in order to reach equilibrium.

## III. Laboratory Evaluation of Tread Stocks

There is at present general agreement in the tire industry that the following properties are the most important for correlation with actual tire service:

A. *Elongation:* Good elongation at overcure and/or high temperature and/or after approximately 24 hours in the oven at 100°C. is the most important characteristic for GR-S tread compounds.

B. *Mechanical Efficiency, Resilience and Related Properties:* This is the second most important property that can be given sound numerical evaluation.

C. *Shore Hardness:* This property and those that follow are secondary to the two properties just listed, and it is not possible at present to distinguish between them with respect to importance. There is probably an optimum tread hardness for each type of tire service. Range at room temperature is between 50 and 70, and stocks should show a minimum change in hardness as measured by hot vs. room temperature determinations.

D. *Modulus:* There is probably an optimum modulue for each type of tire service. No range can yet be recommended, but such data should be kept in mind for future correlation with service results.

E. *Tear Resistance.*

F. *Tensile Strength.*

The following laboratory tests may also be of interest for tread stocks, and may or may not be reported upon at the discretion of each individual laboratory.

G. *Cut Growth Resistance.*

H. *Abrasion Resistance.*

### IV. Laboratory Evaluation of Carcass Stocks

For carcass stocks laboratory tests are rated in the following order of importance:

A. *Mechanical Efficiency, Resilience and Related Properties.*

B. *Elongation:* Good elongation at overcure and/or at high temperatures and/or after approximately 24 hours in the oven at 100°C.

C. *Modulus.*

D. *Shore Hardness.*

E. *Tear Resistance.*

F. *Tensile Strength.*

A test for flexing life may also be of interest for carcass stocks, and may or may not be reported upon at the discretion of each individual laboratory.

### V. Carcass Rupture Resistance Tests

In view of the fact that a good percentage of tire failures in Army service are impact breaks of various types, it is important that some evaluation of total carcass strength be made. Bureau of Standards penetration test, guillotine test or any similar method may be used, results being compared with same size rubber tire.

### VI. Indoor Wheel Tests

It has been found as the result of a careful survey, that it is impractical to set up a standardized test wheel procedure. Furthermore it has been generally agreed that such a standardization would not be desirable, as maximum flexibility of test conditions is required in order to produce the various desired types of failure. Also severity of tests must be constantly adjusted in order to test properly the quality of the tires as they are improved.

Therefore, it is suggested that each laboratory continue to operate its indoor wheels in accordance with its previously adopted standards; in each case, however, reporting results in terms of a control tire, preferably a rubber tire of WPB standard construction. In each case the conditions of test must be completely described. In dealing with failures the following standardized nomenclature will be used:

A. *Heat Break.*

1. Blow-out at crown.
2. Blow-out at shoulder region.

B. *Flexing Break* (breakdown of cord plies in shoulder region.)

C. *Tread Separation.*

1. Induced by cushion and/or breaker fatigue.
2. Induced by tread cracks.

D. *Ply Separation* (indicate which plies and location —crown, shoulder, sidewall, etc.).

It is requested that details on the results of analysis and tests on the failed tires be included in the wheel test reports. Furthermore it is requested that detailed measurement data including tire growth be given. Both mold and inflated tire measurements are desired, as follows:

1. Outside Diameter.
2. Cross section.
3. Curing ring width and measuring rim.
4. Tread width (arc).
5. Tread radius.
6. Tread design depth (center).

### VII. Road Tests

The same general comments apply as for indoor wheel tests. It is suggested, however, that in all road tests, rotation of tires be from right rear to left rear and vice versa, with the same for the front positions rather than rotation completely around the car. It is agreed that this method results in a more severe and more rapid test for the rear tires. Here again comparisons with WPB standard construction rubber tires must be included.

The same standardized nomenclature will be used in dealing with failures as that shown above for indoor wheel tests, with the following additions:

E. *Bruise Break.*

F. *Punctured and Run Flat.*

G. *Bead Failure.*

H. *Defective Inner Tube.*

Same comments apply with regard to results of analyses, tests and measurements as given above under indoor wheel tests.

## Moldless Tire Repair Equipment

A new method of curing repairs in unusual sizes and types of tires without the use of a sectional bag and without the use of a section mold has been developed by James C. Heintz & Co., 3738 West 143rd St., Cleveland, Ohio. Regardless of how the pneumatic tires are built, this new method of repairing them should work satisfactorily, according to the company.

The tire is mounted on an especially built full circle rim. A curing tube with a steam inlet and return connection is placed inside of the tire for the purpose of obtaining heat and pressure. Steam is circulated through the bag. A special contour block to fit the exact part and shape of the tire is strapped on the outside of the tire. Steel straps are placed on the tire in the area of the repair to retain the repaired section of the tire in correct shape during the vulcanizing operation. A special electrically heated spotter is attached to the spot block.

The repair is built up according to any standard practice or procedure. The full circle steam bag inside the tire furnishes the heat to cure the inside of the repair. The plug is cured by means of the contour blocks and spotter. The actual time required to cure the repair is approximately the same as with a standard sectional mold and sectional steam bag. The result is an effective repair that is properly vulcanized in place in the tire.

# Advances in Rubber During 1942[1]

By J. H. DILLON

*Head, Physical Research Division,*
*Firestone Tire & Rubber Co., Akron, Ohio*

PEARL HARBOR and subsequent events in the Far East have made 1942 a year of amazing and far reaching changes in the field of resilient materials. With the United Nations suddenly cut off from over 90 per cent of their crude rubber sources, it became necessary to develop immediately and produce adequate quantities of rubber substitutes. In general, the principal emphasis in the field of synthetic rubber prior to the war emergency had been to develop "specialty rubbers," designed to give better performance in certain particular types of service where resistance to oil, solvents, ozone, etc., was essential. Substantial progress in the development of general purpose substitute rubbers had been made, but large scale experience in their production and application was lacking as 1942 began.

## Military Requirements Met

Fortunately, a moderate supply of crude rubber existed in the United States and this, combined with a large production of reclaimed rubber, has served to meet essential military requirements as the great Buna S* plants come into production and experience is gained with Buna S products of all types. Meanwhile the limited production of neoprene, Thiokol, Butyl, and the several varieties of acrylonitrile-butadiene rubbers are being used to capacity in specialized military applications.

It is clear, then, that the mechanical engineer no longer has at his disposal unlimited quantities of resilient materials of time-tested quality. His first responsibility in 1943 is to reduce or, if possible, eliminate rubber or synthetic rubber in existing machines and other products and employ it as little as possible in new designs. He must be thoroughly conversant with the availability and properties of the various types of rubbers, natural and synthetic, so that he may be able to select the type best suited to a given application without unnecessary depletion of the limited supply of the higher quality rubbers.

An excellent summary on the present supply and projected production of natural and synthetic rubbers is given in the complete Baruch Report *(1)*. An accurate description of progress in synthetic rubber is given by H. I. Cramer *(2)*. Necessary war time secrecy has severely limited publication of detailed data on military products employing rubber and synthetics. Nevertheless, because of the magnitude of the development program, a considerable literature has accumulated in 1942. Reclaimed rubber *(3, 4)* found increasing use in combination with both natural rubber and Buna S. Passenger tire recaps made entirely with reclaim have given reasonably good tire mileages. An improved type of reclaim has been announced by Boston Woven Hose & Rubber Co., but details as to its manufacture and properties have not been publicly announced *(5)*.

While small but important shipments of Hevea rubber should continue to arrive from Africa and from South and Central America in increasing amounts, intensive efforts have been made to develop other natural rubber-yielding plants which can be grown in North America. Of these, the guayule shrub is the most promising and, as projected plantings give greater and greater yields, guayule rubber in its deresinated form will be of great value as a partial replacement for Hevea rubber. Passenger car tires and tubes made exclusively of underesinated guayule were reported to give mileages of 8,500 to 10,500 as early as 1934 *(6)*. More recent data on the properties of guayule have appeared *(7, 8)*. Other types of rubber-yielding plants which are being studied include *Cryptostegia Grandiflora, Fosteronia Floribunda, Asclepias Sublata* (milkweed), and golden rod. X-ray diffraction diagrams showing the similarity of these rubbers to Hevea have been published *(9)*.

## Properties of Buna S Rubber

Buna S, a copolymer of butadiene and styrene, has been chosen as the principal mass-production synthetic rubber on the basis of its general characteristics and relative facility for economical production from domestic raw materials, petroleum or alcohol and coal tar. Like all known synthetic rubbers, it has a rather high internal friction and hence generates more heat in dynamic applications than does natural rubber *(10)*. It is weak and easily torn in a gum stock, but, when loaded with adequate concentrations of carbon black, shows good tensile and abrasive properties *(11, 12, 13)*. It appears to resist decomposition at high temperatures better than does natural rubber *(14)*. It resists oils, solvents and ozone to about the same extent as natural rubber and is not outstanding in these respects. Although more difficult to process than natural rubber, with certain changes in techniques, it can be handled with regular rubber processing equipment *(15)*. Difficulties are encountered in adhering it to itself because of its characteristic lack of tack in the unvulcanized state, but these are being overcome *(16)*.

Passenger tires constructed entirely with Buna S compounds have proved fully equal to tires made with

---

Note: This report was intended for presentation before the meeting of the Rubber and Plastics Group of the American Society of Mechanical Engineers, held in New York City on December 3, 1942. Because the full report was not prepared in time for presentation at the meeting (through no fault of the author's) only a brief resume was given by E. F. Riesing of the Firestone Tire & Rubber Co. The present publication is the first of the full report.

* Note that the Buna S made in the United States is similar, but not identical, to the German Buna S.

Hevea rubber. Truck and bus size tires have presented a greater problem, but rapid developments of the past few months indicate that this problem is being solved also. This same statement applies to nearly all mechanical goods applications. Unquestionably, the development of processing methods and compounds of Buna S in 1942 constitutes the greatest progress in the rubber industry in many years. Much remains to be learned in the application of Buna S and the mechanical engineer will play an important part in this program.

## Some New Types of Neoprene

Neoprene in its various forms can hardly be termed a development of 1942 for engineers had become familiar with its high resistance to oils and ozone *(17)* and had found many applications for it. Because of its oil and solvent resistance it has been employed in self-sealing fuel tanks and hose. Because of its low permeability to gases and high ozone resistance it has been used almost exclusively for coating the fabric of barrage balloons which now operate at altitudes of 10,000 to 15,000 feet. The low resistance of neoprene to cold, as compared to Hevea rubber and Buna S, has become a serious difficulty in its application to high altitude airplane parts *(18)*. However, a new variety, Neoprene FR, has been brought out which has a much improved flexibility at low temperatures *(19)*. Neoprene cements have been of great value for adhering not only neoprene but natural rubber and other synthetics. Neoprene latex appears to show promise in many applications.

The acrylonitrile-butadiene copolymer type synthetics (Perbunan, Hycar OR, Chemigum I, II, and III, Butaprene N types, etc.) have not yet been manufactured in large volume because of the necessity of employing most of the available butadiene in Buna S and the acute shortage of acrylonitrile. The limited amounts available, however, have been used very effectively in self-sealing fuel and oil tanks, bullet-proof hose, etc., where their exceptional resistance to ordinary gasoline and oil are of value *(20, 21)*. They are not entirely proof against aromatic fuels and lose flexibility at low temperatures. Butaprene NF, a material of this type having improved resistance to cold, has been announced *(22)*. Materials of this type are not comparable to neoprene and Butyl in resistance to ozone. Like Buna S, they require a rather high carbon black loading in order to develop good physical properties, have a higher internal friction, and are more difficult to process and adhere. In general, a rather high percentage of a softener (10 per cent or more) is employed to make processing possible. Such softeners thus act as extenders for the material and in some cases improve its low temperature flexibility.

Butyl rubber, reported to be a copolymer of isobutylene with butadiene or isoprene, has become available in small quantities for certain special military uses *(23, 24)*. It possesses a very low chemical unsaturation and hence is very stable chemically. It has a very low permeability to gases and at the same time has a lower specific gravity than neoprene, 0.9175 as compared to 1.25 *(25)*. Hence, it has excellent possibilities as a proofing material for balloon fabrics. It has been tested in passenger size tires and in recaps, but does not appear to have the abrasion resistance possessed by Hevea rubber. It has been stated that it is adaptable to fire hose, steam hose, molded goods and conveyor belts. A more easily produced lower quality variety of Butyl called Flexon has also been tested as an emergency recap material for passenger tires with some success.

The several varieties of Thiokol, organic polysulfides, have been in use for a number of years in products where oil resistance, ozone resistance or low gas permeability is essential *(26)*. Thiokol has an extremely unpleasant odor and is thermoplastic. Hence, it is very limited in application. However, recent tests with Thiokol recaps have indicated it as a possible emergency material, providing its extremely poor cold resistance is corrected. A new odorless variety, Thiokol RD, has lately been announced which is reported not to be a polysulfide reaction product *(27)*.

A group of materials which can be used to replace rubber in gaskets, hose, coatings, etc., but which are thermoplastic and not highly extensible, has become increasingly important *(2)*. This group includes Koroseal, Vinylite, Resistoflex *(28)*, Velon, Saran, Formvar, Butvar, Butacite, Acryloid, plasticized ethyl cellulose, and plasticized cellulose acetate *(29)*. Most of these materials are tough and flexible, and have high resistance to oils and solvents. Some of them have been tested in tire recaps with small success to date. Incidentally, all materials of low extensibility, such as wood, vulcanized fibre, etc., have proved entirely unsuitable for automobile tires, in the opinion of competent engineers, although many optimistic statements have appeared in the public press. A new product called Norepol, produced from soybean oil, appears to approximate rubber to a higher degree *(30, 31)*. It has shown promise as a tire recap material.

## Heavy Duty Tire Development

The greatest product development of 1942 is undoubtedly that of the synthetic rubber heavy duty tire. Details are completely lacking in the literature and none can be revealed here. Some basic design data on tires have been given, however *(32, 33)*. An interesting paper on rubber tracks for military vehicles and tractors has been published *(34)*. Intensive work has been done on bullet-proof combat tires and tubes for various types of military vehicles. The replacement of rubber in tank track blocks by steel has eliminated a difficult problem for the rubber technologist and results in a large rubber saving. However, it is doubtful if this step will make the perfection of the bogie roller less difficult. It certainly has not eliminated tank radio static. The introduction of electrically conducting rubber in the track block bushings should be effective in this respect. A paper which treats the problem of static electricity in pneumatic tires and its solution by means of electrically conducting treads and sidewalls has been published *(35)*. Conducting rubber compounds have been employed to an increasing extent in 1942 in airplane tires, industrial tires for munitions plants, flooring and caster wheels for hospital operating rooms, truck and bus tires, etc.

Very little detailed information has been given on the many new types of rubber parts for aircraft and military vehicles. Two very valuable papers on the vibrational properties of rubber have appeared *(36, 37)*. Outstanding among aircraft developments are self-

sealing fuel and oil tanks. Their use has already permitted the return of many a bullet-riddled bomber or fighter to its base and saved the lives of many pilots. In general, these tanks have been of the internal type. The 1942 designs have been improved in sealing qualities against heavy caliber ammunition, effectiveness at low temperatures, and resistance to penetration of fuel through the inner liner. Weight and wall thicknesses have been reduced. The danger of extraction of soluble materials from the inner liner has been greatly decreased and the problems introduced by the use of aromatic fuels are approaching solution. It now appears that fuel tanks must be made "crash proof" as well as self-sealing. Self-sealing hose for fuel and oil lines has been vastly improved in 1942 also.

Intensive development work has resulted in a wide variety of inflatable products classed as flotation gear. This class includes life belts, life rafts, landing boats, and pontoons capable of supporting a bridge for 30-ton tanks. Several varieties of barrage balloons for both naval and land service have been engineered and put into large scale production during the past year.

In the field of industrial products, conveyor and transmission belts reinforced with steel cable cords have been notable contributions to war production. A new development in airplane tire design is the "Channel Tread" which is reported to give improved traction, flotation, and load carrying capacity. It is particularly effective in tail wheel tires for catapult planes. An airplane tire with metal studs cured into the tread for use on ice-covered landing strips has been announced. Another type has a tread made of soft crepe rubber. An extremely interesting item, from the standpoint of the future, is a soundproof room supported on rubber, developed at Northwestern University.

Work on the ASTM Hardness Test project has been interrupted by the exigencies of the war effort. Tentative recommendations have been made, however *(38)*. A laudable beginning has been made by a joint A.S.T.M.-S.A.E. committee in the classification of rubber and synthetic rubber stocks according to their physical properties *(39)*.

The technical literature includes many valuable papers on the properties and testing of natural and synthetic rubber stocks *(40* to *47)*. An enormous amount of theoretical work on the structure of rubber-like materials has been reported in the literature of the past year *(48* to *53)*. Only a few of these papers can be included in this bibliography, but it may be said that great progress has been made in this field which will eventually lead to results with practical engineering value. In general, progress in rubber technology and engineering in 1942 has been of the highest order. When the necessity of war-time secrecy finally disappears, 1942 may prove to have been the outstanding year in the history of rubber.

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## Shielding Plant and Personnel Against War Hazards

AN interesting paper on "Shielding the Plant and Personnel Against War Hazards in the Rubber Industry" was delivered by Arthur B. Guise, of the Central Safety Department, U. S. Rubber Co., New York, at the recent meeting in Chicago of the Rubber Section of the National Safety Council, Inc. Excerpts from this paper, as prepared by the News Letter Editor of the Rubber Section's bulletin, follow:

Our wartime hazards are largely exaggerations of the peacetime hazards which appeared from time to time with the development of new materials and new processes. Green workers and less experienced supervisors increase the difficulty of coping with the hazards and the answer appears to be in a more intensive education of the supervisors, and through them, the workers.

The increased use of plastics and synthetic rubber has brought into our plants solvents new to us from the standpoint of general use. Ethylene dichloride and methyl-ethyl ketone, for example, are used in quantity. Some of the new solvents have a more distinctive odor than the solvents previously used in rubber plants. For example, acetone and methyl-ethyl ketone have a strong odor and an irritating effect on the nose and throat. A maximum concentration of 500 parts per million is suggested, although there has been excellent experience at much higher concentrations.

Ethylene dichloride has a not unpleasant odor and is less toxic than carbon tetrachloride. Some of the reported cases of nausea among workers may be from psychological rather than physiological causes. Although the fire hazard of ethylene dichloride cannot be neglected, it is not as bad as benzol or naphthas.

The fire and explosion hazards introduced into rubber plants are not new. They are only greater in number and in a somewhat different form. To be sure, some of the new solvents are highly water soluble or are miscible, and foam extinguishers are not as suitable on fires in these solvents. Acetone, alcohol, diacetone and methy-lethyl ketone are in this class and carbon dioxide or approved gas-pressure dry chemical extinguishers should be used to fight such fires.

The extinguishers provided for areas where women are working should not be heavy. A large number of smaller extinguishers is preferable. Key personnel throughout the plant should be trained in the use of extinguishers. Water spray nozzles throwing a cone shaped spray will move a surprising amount of air if placed in a horizontal duct of 18 in. to 24 in. diameter. Those plants having spare low capacity high pressure water pumps might use this method of obtaining positive ventilation, keeping the cost down by recirculating the water.

Static electricity is always with us and the most practical method of reducing it where brushing cements comprise an important portion of the work is to humidify the room to at least 50% relative humidity. It is fully realized that in the winter this humidification will require a considerable amount of additional heating steam but the alternative would be to provide conductive flooring and have the workers wear shoes with conductive soles. The difficulty of keeping the floor and the soles conductive where cement is used should not be overlooked.

The majority of fire doors are automatic closing in case of a fire but if blocked open by material piled against them they have lost their automatic functioning. A firewall is no better than the firedoors that protect its openings and frequent inspections are necessary to insure proper operation of the doors. In some locations a guard to prevent piling of material against the door may be advisable.

# Abstracts of United States Patents on the Compounding and Use of Synthetic Rubber

By FREDERICK MARCHIONNA, M. S. Chem.

## Part VII

**Denman—U. S. Pat. 2,186,284—January 9, 1940. *Oil-Resistant Gasket.* (Assigned to Detroit Gasket & Mfg. Co., Detroit, Mich.).**

An oil-resistant gasket comprises asbestos, paper fibre or cork powder, or a mixture of cork with asbestos powder or paper fibres, bonded with a Thiokol binder. A preferred composition includes comminuted cork (15), Thiokol (30), stearic acid (0.1), accelerator (1), zinc oxide (2), and gas black (5). The mixture is rendered homogeneous by milling, is sheeted, wrapped around a drum, and cured at approximately 287° F. for 4 minutes. Gaskets cut to the desired shape and size from the cured material are particularly suitable for automotive use.

**Youker—U. S. Pat. 2,186,714—January 9, 1940. *Plasticized Polyalkylene Polysulfide.* (Assigned to E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware).**

Polyalkylene polysulfides sold under the trade name of Thiokol are peptized—plasticized—by incorporating therein small quantities of a thiophenol with a mercaptan. Thus, in one example, Thiokol D (the reaction of alkali polysulfide with B.B.-dichloroethyl ether) is plasticized by milling with a mixture of 0.5% of tetra-methyl thiuram disulfide and 1% of thio-beta-naphthol. Neither of these compounds alone are effective in plasticizing the polysulfide, but the mixture is exceedingly effective. In another example, Vulcaplas (the reaction of dichlorhydrin with an alkali polysulfide) (100) is plasticized with 5 parts each of this beta naphthol and tetramethyl thiuram disulfide. A mixture consisting of Thiokol D (100), zinc oxide (10), diphenyl guanidine (0.1), benzothiazyl disulfide (0.25), stearic acid (0.5), and Gastex carbon black (100) is cured and dissolved immediately in benzene when the mixture described above is added. The mixture can be precipitated with alcohol.

**Wodtke—U. S. Pat. 2,186,793—January 9, 1940. *Electrical Insulation.* (Assigned to Anaconda Wire & Cable Co., New York, N. Y.).**

A flexible multi-conducting cable comprises a plurality of conductors, a microporous rubber layer around each conductor (of sufficient thickness to insulate the conductors from one another), and an overall insulating jacket covering the entire insulated assembly, this jacket being made from a material having high resistance to abrasion. In the example given, two wire conductors are insulated with a rubber insulating layer in the conventional manner. These insulated wires are then twisted together and filled and covered with a blowable rubber composition, or preferably a compounded polychloroprene. The latter may consist of polychloroprene (100), magnesium oxide (10), rosin (5), cumar resin (10), cottonseed oil (10), zinc oxide (10), factice (100), sulfur (1), sodium carbonate (15), pine tar (3), stearic acid (4), and antioxidant (1). A compounded rubber containing 50% of carbon black and vulcanizing ingredients is then applied in the form of a jacket over the blowable polychloroprene cover. After placing a lead sheath over this jacket, the assembly is subjected to heat in a vulcanizer, whereby the polychloroprene cover is rendered porous and the rubber is vulcanized.

**Calcott et al—U. S. Pat. 2,187,146—January 16, 1940. *Coagulating Polychloroprene Latex.* (Assigned to E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware).**

In a method of coagulating polychloroprene latex, a continuously moving surface, such as a roll, is cooled to a temperature below —5° C. and moved in and out of contact with the polychloroprene latex at such a rate that the surface will pick up a thin layer of the cooled latex in the form of frozen film. The moving roll continues to rotate in the latex until a coagulated film of frozen latex of the desired thickness is deposited thereon. This layer is then stripped from the depositing surface, the ice melted therefrom, and the deposits then washed and dried. In the specific example cited, a cylindrical vessel of Monel metal is partially filled with dichloro-tetra fluoro ethane as refrigerant, this material being refluxed at a pressure of 346 mm. of Hg. to keep the temperature within the cylinder to —15° C. Polychloroprene latex, precooled to 2° to 5° C., is then placed in a vessel and the cooled cylinder immersed and rotated in the latex until it has thereon a uniform deposit of frozen polychloroprene about 0.023-inch thick. The cylinder is then removed from the bath, kept at the freezing temperature of the deposit for about 20 seconds to effect complete coagulation of the polychloroprene, and the layer stripped from the cylinder, warmed to thaw the ice, and dried in warm air. In one example, the latex contains polychloroprene (100), sulfur dioxide (4), and 400 parts of 2% aqueous cetyl trimethyl-ammonium bromide. In another, a hollow steel cylinder rotating in a horizontal axis at a peripheral speed of 6 feet per minute is cooled to —8° C. and rotated in the cooled latex to form a frozen layer which is treated as above and which may be washed in ethyl alcohol before drying.

**Merrill—U. S. Pat. 2,188,284—January 23, 1940. *Golf Ball Cover.* (Assigned to Wingfoot Corp., Akron, Ohio).**

Golf ball covers are produced from a mixture of polychloroprene and a cyclized rubber. In the example given, a cyclized rubber obtained by reacting rubber with chlorostamic acid (60) is milled with polychloroprene (40) and crepe rubber (20) and calcined magnesia (4) with titanium oxide (8) and zinc oxide (1.5) admixed therewith before the incorporation of the polychloroprene. Equal parts of polychloroprene and cyclized rubber may, however, be used. The cover composition may be formed into hemispherical cups which are placed over the ball center and molded thereon by heat and pressure. The ball may be painted as desired and treated with tin tetrachloride before painting.

**Merrill—U. S. Pat. 2,188,285—January 23, 1940. *Golf Ball Cover.* (Assigned to Wingfoot Corp., Akron, Ohio).**

This is a variation of U. S. Pat. 2,188,284 for producing golf ball covers, the variation consisting of the use of balata instead of cyclized rubber in the polychloroprene composition. The cover material may consist of polychloroprene (25), balata (75), titanium oxide (10), zinc oxide (1.5), and magnesium oxide (2.5). The metal oxides are first milled with the polychloroprene and then admixed with the balata. A quantity of rubber hydrochloride or chlorinated rubber may be added to the above mixture in suitable quantities to harden the golf ball cover. The mixture is molded about the golf ball core as in the first patent, treated with bromine, chlorine, tin tetrachloride, etc., and then painted.

**Poschel—U. S. Pat. 2,188,867—January 30, 1940. *Rubber Ink.* (Assigned to Meyercord Co., Chicago, Ill.).**

In a transfer process of printing on soft rubber by means of a water-soluble gum coating on a paper base, the design of the desired color is impressed on the gum coating with a latex or a polychloroprene ink, preferably the latter which is better for intaglio or rotogravure printing. An ink formula may contain polychloroprene (1000), methyl isobutyl ketone (2500), xylol (2500), magnesium oxide (100), zinc oxide (50), rosin (25), rosin oil (25), and antioxidant (5), plus the required color pigment in the desired quantity. The rosin and rosin oil in the ink prevent scorching of the ink coating in the mold. The printed design with this ink is then transferred from the transfer paper base on to any flexible rubber article to be decorated in the conventional way to obtain a printed rubber article which is durable and beautiful.

**Hatherell—U. S. Pat. 2,190,021—February 13, 1940. *Chewing Gum.* (Assigned to Frank A. Gerbutt & Co., Los Angeles, Calif.).**

A chewing gum is prepared from a base comprising a rubber-like plastic—lastic—and a resin, the "lastic" being selected from natural rubber, polybutadiene, polychloroprene, etc., while the resin is preferably a high melting point cumar resin. The quantity of resin may be from 13 to 20% of the mixture. A preferred ratio of lastic to resin is 3 to 4:1 or 1:1. In compounding, the lastic is passed repeatedly between warmed milling rolls while powdered resin is added and incorporated therein to form a sheet in which the ingredients are uniformly mixed. The milling rolls are preferably kept at 80° to 140° F. whereby the resin melts and fluxes with the lastic. Additional low melting point resins, waxes and proteins may also be admixed with the above base. The chewing gum is produced by adding sugar, flavors, etc.

**Kirby—U. S. Pat. 2,192,318—March 5, 1940. *Polychloroprene Latex.* (Assigned to E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware).**

In the production of polychloroprene latex in which the polychloroprene particles are positively charged, a chloroprene is dispersed in an aqueous acid solution of casein, and then polymerized to form a latex having its polychloroprene latex positively charged. Thus, casein (1) is dissolved in glacial acetic acid (52) and water (130) and chloroprene (46) added gradually with constant agitation to form a homogeneous emulsion which is kept at room temperature to polymerize the chloroprene into fine particles having a (+) charge, the particles being uniformly dispersed in the aqueous acid medium. In another example, gelatine (5) in water (100) is added to an aqueous alkaline solution of 49% chloroprene, with enough acetic acid or sulfuric acid to cause the emulsion to turn the congo test paper blue. When allowed to polymerize there is obtained an acid polychloroprene latex. Stabilizers, such as catechol, pyrogallol, eugenol, etc., may be added in small quantities to the latex. Coagulation of this latex may be effected by treatment with sodium chloride or sulfate, calcium chloride, methanol, ethanol, acetone, etc., or by the use of an alkaline polychloroprene latex.

**Wedger—U. S. Pat. 2,194,579—March 26, 1940. *Plastic Products.* (Assigned to B. B. Chemical Co., Cambridge, Mass.).**

Thermoplastic products particularly suitable for filming, coating, molding, casting, etc., comprise from 25 to 75% of polychloroprene with 25 to 75% of a polyvinyl resin, particularly polyvinyl acetate. A product consisting of polyvinyl acetate (25) and polychloroprene (75) has a softening point above 30° C. But mixtures containing 40, 50, 60 and 75 parts of polyvinyl acetate with 60, 50, 40, and 25 parts, respectively, of polychloroprene have a softening point above 40° C. By incorporating about 3% of sulfur with 1% of an accelerator, such as phenyl-beta-naphthylamine, and 5% rosin, with 10% magnesium oxide and 5% zinc oxide, the composition can be cured. A fabric may be treated first with polychloroprene and then with the polyvinyl acetate; or it can be impregnated with the mixture of the two. These products are particularly suitable for making molds for use in shaping shoe bottoms. Shoe stiffeners, *e.g.*, box toes, counters, etc., may be produced by rolling the composition into sheets of suitable thickness, with or without a fabric reinforcement, and cutting blanks therefrom.

**Patrick—U. S. Pat. 2,195,380—March 26, 1940. *Plastic Thiokols.* (Assigned to Thiokol Corp., Trenton, N. J.).**

This patent claims the heating of polyalkylene polysulfides with an oxidizing agent which provides an acid under curing conditions. The various types of Thiokol are described in detail, with the chemical structure of each type given. In one example, the ether type of polyalkylene polysulfide plastic (100) is mixed with zinc oxide (10), carbon black (60), stearic acid (0.5), and mercaptobenzothiazole (1), and cured at 290° F. for one hour to obtain a cured product having a tensile strength of 1700 lbs./sq. in. and an elongation at break of about 500. This cured material has excellent tear and abrasion resistance and its electrical properties are similar to those of natural rubber. A polysulfide plastic of high sulfur content—above 70%—can be disulfurized by treatment with an alkali metal hydroxide or other disulfurizing agent.

**Atkinson—U. S. Pat. 2,196,407—April 9, 1940. *Gasket.* (Assigned to Westinghouse Electric & Manufacturing Co., East Pittsburgh, Penna.).**

A resilient gasket material which will be oil-resistant comprises a predominant quantity, by volume, of shredded cork, carbon black or other fillers adapted to impart toughness to the article and increased resistance to hot oils, about 15% of polychloroprene, and an antioxidant. A suitable formula for the gasket material consists of 25 to 75% of polychloroprene with 75 to 25% of granulated cork, combined by kneading. From 5 to 20 parts of carbon black are added to increase the oil resistance and the toughness of the gasket. The carbon black is mixed with the cork first and the polychloroprene then incorporated therein. An antioxidant, such as pyridine, may be added up to 10% of the mixture.

**Browne—U. S. Pat. 2,196,602—April 9, 1940. *Polychloroprene Cements.* (Assigned to B. F. Goodrich Co., Akron, Ohio).**

A solution suitable as coating material or as an adhesive cement comprises polychloroprene dissolved in a dialkyl ketone containing at least 4 carbon atoms, including methyl propyl ketone, methyl isopropyl ketone, di-isopropyl ketone, cyclohexamone, mesityl ketone, etc., producing flowable 10% solutions thereof. A good cement is obtained by dissolving neoprene in equal parts of isopropyl acetate and methyl-ethyl ketone. A coating material may comprise neoprene (41.5), magnesium oxide (2.1), gas black (42.9), cumar resin (8.35), rosin oil (4), and an antioxidant (0.85) dissolved in methyl propyl ketone by agitating for two hours. A cement in the form of a 10% solution in equal parts of gasoline and methyl-ethyl ketone contains neoprene (90) and rosin (10). A bonding cement comprises 50 parts of the above compounded polychloroprene and 50 parts of a mixture consisting of natural rubber (61.15), gas black (22.2), zinc oxide (3), hardwood pitch (6.5), pine tar (2.25), cottonseed fatty acids

(2), sulfur (2), an antioxidant (0.5), and mercaptobenzothiazole (0.4). This mixture is easily dissolved in a liquid containing 3 volumes of methyl propyl ketone and 1 volume of gasoline, or equal volumes of the two liquids.

**Eger—U. S. Pat. 2,197,127—April 16, 1940. *Bonding Thiokol Plastic to Rubber.* (Assigned to U. S. Rubber Co., New York, N. Y.).**

Thiokol plastics, as described in U. S. Patents 1,981,968 and 2,049,974, are bonded to rubber, rubberized fabrics, or other bases by means of an intermediate cement layer of rubber containing a tacky resin. Thus, a rubberized fabric base is coated with a cement adhesive consisting of natural rubber (47 lbs.) and rosin (85 lbs.) dissolved in 68 gals. of gasoline and dried into a tacky condition. The Thiokol, preferably in the form of solution in organic solvent, is then applied to form a coating layer of the required thickness and the fabric cured to effect a strong, permanent bond between the Thiokol and the fabric base. This process can be used for producing vehicle tires.

**Hale—U. S. Pat. 2,197,929—April 23, 1940. *Tree Protection.***

Trees, shrubs, etc., are protected against seasonable changes in temperature by enclosing the plant in "Celloveil," a mantle section made up of light permeable film and an integral or detachable open mesh veil. This Celloveil is sprayed or otherwise treated with a film-forming material, *e.g.*, ethyl cellulose, polybutadiene, etc. Preferably, the film-forming material should incorporate a substance having marked hygroscopicity and suitable to accelerate disintegration of the film surface coating, such substances including bornyl chloride, camphene, bornylene, naphthalene, metaldehyde, para-dichlorobenzene, etc. A good sprayable material for application to the Celloveil consists of acetone (50) and 50 parts of water in which there is added 1% of a mixture of the film forming material, plus equal parts of bornylene, lauryl sodium sulfate, and cellulose acetate or polyisobutylene.

**Watermann et al—U. S. Pat. 2,198,927—April 30, 1940. *Extruding Polymerized Products.* (Assigned to Shell Development Co., San Francisco, Calif.).**

Polybutadiene, polychloroprene, polyvinyl compounds, cyclized rubber, etc., are extruded into filaments, films, tapes, etc., by forcing a solution thereof through spinnerets and then vertically into a coagulant liquid consisting at least of a substantial quantity of a lower aliphatic ketone, such as acetone, methyl ethyl ketone, acetophenone, etc. The partially coagulated filament is drawn through the coagulant at a rate greater than the spinning rate and then passed immediately through a hardening bath of glycerol, glycol, primary or secondary hexyl, heptyl or octyl alcohols, etc., to effect complete coagulation of the extruded material. In a specific example, a 10% solution of sodium-butadiene rubber in benzene is spun into a vertically disposed device consisting of a V-shaped tube having a total length of 175 cm. and filled with ethyl alcohol, the spinning being effected at the rate of 5 to 10 m./sec. The formed thread is withdrawn through the coagulant bath at a higher rate of speed. Immediately after leaving the coagulant bath, the thread is passed through a bath of glycerine maintained at approximately 140° C. to harden the thread, after which it is dried, wound on bobbins, and can be used for making textile fabrics.

**Dickey—U. S. Pat. 2,200,356—May 14, 1940. *Temple Rolls.***

A roll for a loom temple consists of a core covered with a plurality of canvas layers which have been coated on both faces with a thermosetting material which is permanently tacky. This material comprises polybutadiene rubber combined with Thiokol, Vistanex, cumar resin, etc. In a specific example, Thiokol D is milled at 160° F. for 25 minutes with 0.5% mercaptobenzothiazole and 0.2% diphenyl guanidine or triphenyl melamine, and then admixed with Buna N or Perbunan (butadiene rubber) previously softened by milling at 175° to 200° F. and with a phenol-cumar resin, using Thiokol (100), polybutadiene (100), Vistanex (47), and cumar resin (53). This composition is stiffened by the incorporation of zinc oxide (5%), paraffine wax (1.5%), stearic acid (1%), sulfur (2%), and di-ortho tolyl guanidine (0.25%). Each fabric layer is coated with calendered layers of the mixture to increase the weight of the fabric 24%. A number of such fabrics are cut into washer-like shape which are compacted into rolls provided with grooves and fitted over the temple core. A small quantity of methyl or ethyl phenyloxolate, benzoate, or phthalate can be incorporated in the composition.

**Sullivan—U. S. Pat. 2,201,931—May 21, 1940. *Artificial Leather.* (Assigned to E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware).**

An artificial leather comprises a napped fabric coated on the unnapped face with a rubber-newsprint paper fibre composition. The rubber may consist of natural rubber or polychloroprene rubber. When polychloroprene is used, the fabric base is first coated with a xylene cement of polychloroprene (40), zinc oxide (8), magnesium oxide (8), sulfur (0.6), rosin (2), cottonseed oil (2), and whiting (4.8). After this coat has dried, it is covered with another composition consisting of polychloroprene (60), zinc oxide (6), magnesium oxide (6), sulfur (0.6), rosin (3), cottonseed oil (3), and disintegrated newsprint fibre (20). An alcoholic shellac solution is then applied and the surface treated with bromine or chlorine to harden it and to give it a glossy and an oil-resistant surface.

**Wiezevich—U. S. Pat. 2,202,363—May 28, 1940. *Plasticized Rubbers.* (Assigned to Standard Oil Development Co., New York, N. Y.).**

Polybutadiene and polychloroprene rubbers, polyvinyl compounds, etc., are plasticized by admixing therewith a small quantity of a monolefine polymer, *e.g.*, isobutylene or hydrogenated rubber having a molecular weight greater than 800, the quantity incorporated being 1 to 10% or more. The plasticizer may be in the form of solution or aqueous dispersion which can be added to a solution or aqueous dispersion of the polybutadiene compound. In a composition for a tread there is used polybutadiene rubber (100), reclaimed rubber (30), carbon black (50), clay (10), polyisobutylene with a molecular weight of 5,000 (3), sulfur (5), accelerator (1), and antioxidant (1). A cement for adhesive tape may contain polybutadiene or polychloroprene (50), reclaimed rubber (50), polyisobutylene with a molecular weight of 10,000 (30), mineral oil (10), zinc oxide (25), and lithopone (75).

**Safford—U. S. Pat. 2,204,383—June 11, 1940. *Printing Rolls.* (Assigned to General Electric Co., Schenectady, N. Y.).**

This is a division of U. S. Pat. 2,160,230 claiming the use of the alkyd resin-polychloroprene mixture of the earlier patent in the production of printing rolls. To obtain such rolls, a rubber cement is applied on the metal core and a soft rubber cushon layer cemented and vulcanized thereto. A sheet from a mixture of modified alkyd resin and polychloroprene is then wrapped about the rubber cushioning layer. The assembly is covered with a porous fabric and the ends of the roll secured against lateral movement. The roll is then cured with dry heat, cooled, the fabric layer removed, and machined to the proper diameter. The ink surface layer may comprise a plastic polychloroprene (10) admixed with a modified alkyd resin (89) and a flexible phenol-aldehyde resin.

*(To Be Continued)*

BUY
WAR SAVINGS
BONDS and STAMPS

# Replacing Rubber With Synthetic Resin at the Plants of RCA Manufacturing Co.

## A Typical Case History of How American Manufacturers Are Overcoming the Critical Rubber Shortage With "Substitutes"

**By EDGAR S. PEIERLS**

*President,*
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*The properties and characteristics, as well as a few uses, of Resistoflex PVA—a rubber-like compound—were described in some detail in the July, 1942, issue of "Rubber Age." It was apparent from the description published that this flexible, resilient synthetic resin could replace rubber in several important industrial applications. In the current article the author reviews some of the actual replacements which have been made in the plants of the RCA Manufacturing Company, which was highly dependent on rubber in many of its manufacturing processes. So well has the new material worked out that there is some doubt whether this company will revert to rubber in the postwar period. The reasons therefor are told in the article.—Editor.*

WHILE millions of American motorists are finding the rubber shortage annoying and a source of inconvenience, the majority can, if necessary, get by until the synthetic rubber industry is able to meet their needs—even if it takes two years or more. In industry, however, the situation is much more critical. Many rubber parts are used on machines turning out vital war supplies. Stopping any one of these machines means less weapons for the United Nations armies.

### Rubber-Like Materials Meeting Crisis

Industry's answer to this situation has been to substitute other rubber-like materials wherever possible. One of the more successful of these has been the flexible, resilient synthetic resin known as Resistoflex PVA. The RCA Manufacturing Co., which is highly dependent on rubber in many of its manufacturing processes, started farsightedly experimenting with Resistoflex PVA materials a little over a year ago. Today it has supplanted rubber and synthetic rubber with this material in over fifteen separate applications, and in nearly every case the "substitute" is outlasting and outperforming the original material.

A typical example is flexible gas-air lines (Fig. 1). In the manufacture of radio tubes a great number of processes involve the use of gas fires. Since the burners on the machines are frequently in motion and always adjustable, a flexible connecting medium is required to convey the gases from the fixed manifolds to the burner piping. Time honored custom had made the rubber tubing standard for this purpose because of its ready availability, relatively low cost and ease of installation. Similarly, the many connectors between valves, traps, pumps, gauges, etc., on evacuating and sealing machines consisted of molded sections made from almost pure gum rubber.

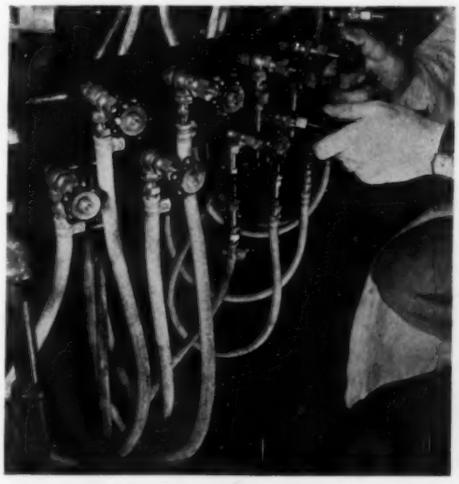


*FIG. 1—Large quantities of rubber tubing have been replaced at the RCA plant with Resistoflex hose, here shown in use as gas and air line connectors on an automatic machine. The hose shown have a Resistoflex PVA material core and a braided cotton outer jacket.*

*FIG. 2—Resistoflex compounds have replaced rubber at the plant in transmission rings which rotate against metal gears to supply power for various operations.*

When the RCA management heard the first whispers of possible rubber scarcities, it set up a rubber conservation campaign, aimed (1) at conserving and prolonging the life of the rubber then on hand, and (2) at seeking out alternative materials wherever possible. In pursuing this second objective, trials of many flexible plastics and synthetic rubber-like materials were inaugurated. These resulted for the most part in an early recognition that a majority of these materials offered very limited possibilities as a replacement for rubber as used at RCA. Others were discarded when they showed signs of uncertain availability. Still others were dropped because they contained high percentages of natural rubber. Eventually the search narrowed down to a comparative few, with Resistoflex PVA material appearing best after all factors were considered.

Preliminary investigation proved that Resistoflex products were highly resistant to the many solvents that attacked the rubber used in RCA's various metal cleaning and other manufacturing processes. These involved the usual carbon tetrachloride, trichlorethylene, acetone and many others. Further tests showed that Resistoflex tubing would convey hydrogen, oxygen, nitrogen, illuminating gas and air as effectively as rubber. Such tubing has since stood up for months even though saturated with hot oil and subjected to continuous flexing at a rate of about six hundred times an hour.

Another advantage offered by Resistoflex tubing was the fact that the compound from which it is extruded could be varied to meet the particular requirements of specific applications. Thus, when RCA first started experimenting with the material, engineers of the Resistoflex Corporation formulated a special compound to meet its needs, and fabricated from this a cotton covered hose especially adapted to its processes. The company has now standardized on this hose for many uses where a quantity of high grade gum rubber was formerly employed. Already the life of this new tubing has proven to be far in excess of that frequently experienced with natural and synthetic rubber. For example, a Resistoflex hose-assembly placed on a machine nearly a year ago has still to show any sign of depreciation, whereas the rubber hose originally used had to be replaced as often as five times a year.

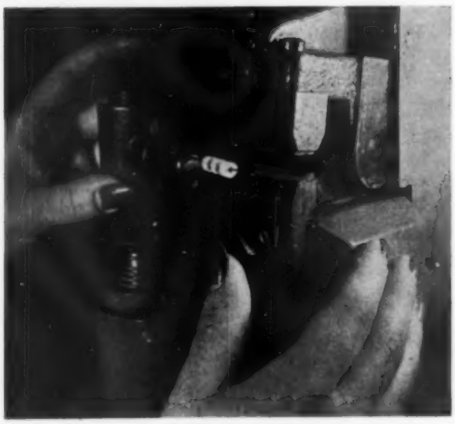


*FIG. 4—The jaws of this forming press, used for small parts, are lined with Resistoflex sheet, which is cemented directly to the metal.*

*FIG. 3—A sheet Resistoflex shield protects the operator's wrists in a sandblast machine for cleaning small parts. This shield is said to far outlast its rubber predecessors.*

Installations of the new hose are made with little or no change in machine design. In fact, in some cases it has eliminated the need for extending pipes as called for by another phase of the rubber conservation program. Only a comparatively few sizes are stocked to match the standard pipe nipples used, and in this respect it is equally as adaptable as the original material.

In addition to replacing rubber with Resistoflex, RCA is also to a large extent using tubing of this type to displace flexible metal hose, generally made of brass, copper, stainless steel, etc. In certain instances even conventional copper tubing and fitted piping are also being so displaced.

While the replacement of rubber tubing was a major objective of the RCA conservation campaign, it did

*FIG. 5—A ball mill gasket being cut from a sheet of Resistoflex. Gaskets made from this compound are said to show increased resistance to the chemicals used at the RCA plant.*

not stop there. The company was also using rubber for many machine parts of a highly mechanical nature. Experiments with Resistoflex in the tubing field had revealed that in addition to having high solvent resistance, and exceptionally low permeability, this material was extremely tough and stood up under both flexing and abrasion. Engineers of the Resistoflex Corp. were therefore asked to revamp samples of their sheet stock until a compound was arrived at which conformed to the Durometer index and texture of the rubber normally used.

Testing of the alternate material was simplified by the ease with which blocks could be fabricated. Pieces were cut or punched from 1/16" or 1/8" sheet. These were then laminated into washers, spacers, rollers, etc., without the need for any special presses or molding machinery. Rough shapes so formed were machined to required dimensions on standard shop equipment. Some such sections were frozen solid in liquid air or mounted onto wooden blocks to facilitate accurate machining.

## Mechanical Application Is Typical

In these mechanical applications, involving abrasive action and torsional strains, Resistoflex has consistently outlasted rubber. A typical instance involves a power transmission device (Fig. 2) wherein a revolving turret carries a series of heads, which in turn are revolved in a sequence of indexed positions. The heads are caused to rotate when their shallow-toothed, metal drive gears are brought into mesh with rings clamped to driven shafts below the turret. Resistoflex has replaced rubber for these power transmission rings, and is consistently outwearing the former product.

In another case a two-ply tube was formed by rolling 1/16" sheet about a 3/8" diameter mandrel. This tube was installed in a sandblast suction line where rubber tubing had worn through in a few days. The replacement tubing has been running for several weeks, and has proven so satisfactory that the company is now ordering special molded Resistoflex tubing for this application. In the same machine sandblast shields made of Resistoflex sheet (Fig. 3) have likewise proven more durable than rubber, while it has also been possible to fabricate the compound to combine maximum protection with the flexibility which is needed for easy operation.

## "Substitute" Becoming Standard

The list of operations where the "substitute" material is becoming the standard is growing daily, and in many cases RCA foremen have stated that they will never return to rubber—even after the war. Among the mechanical parts now being fabricated from the synthetic resin are forming rollers, forming press jaw linings (Fig. 4), aligning devices, vibration dampers, shock absorbers, power transmission rings, foot pedal coverings, metal belt pulley facings, etc. It is called for in ball mill cover gaskets (Fig. 5) where it stands up under solvents which destroyed previous gaskets made from natural or synthetic rubber. Sections of sheet material have been cemented together to make a small parts conveyor belt (Fig. 6) which has proven definitely superior to a belt made of woven wire.

Actually, RCA engineers are beginning to feel grateful for the rubber shortage because its rubber conservation campaign has resulted not only in releasing quantities of the scarce material for more direct use by the armed forces, but also in technological advances through the necessity of testing a material which normally would have been considered too expensive and therefore would not have had the occasion to prove under actual tests that its superiority in service life could make it comparable in cost or even cheaper over the long run.

*FIG. 6—A conveyor belt on a machine making small parts. On this operation a Resistoflex belt has replaced one made of woven wire and has proved superior in that the parts cannot get caught in or stick to the sheet.*

# Editorials . . . . . .

## The Question of Priorities

THE status of the synthetic rubber program, as recommended by the Baruch Rubber Committee and planned by the Office of the Rubber Director, is currently in doubt with respect to the year of 1943. In order to complete production facilities of at least 300,000 to 350,000 tons, top priority ratings of approximately 55% are necessary, according to Rubber Director Jeffers and his chief, Donald Nelson, head of the War Production Board. A decision on the percentage of top priorities is currently awaited from James F. Byrnes, Director of Economic Stabilization, to whom the President has assigned the problem, not particularly in the capacity of stabilization director, but as one of his chief lieutenants in the overall war effort.

Rubber Director Jeffers has stated on several occasions in the past few weeks that unless high enough priorities were forthcoming there was a good possibility that the rubber program for 1943 would fall short of its goal. Although construction of the butadiene, styrene and copolymer plants is moving along at a satisfactory rate, it is growing exceedingly difficult to secure the necessary equipment to put these plants into full operation. In many cases, due to the lack of essential equipment, these plants are operating at only a minute portion of their potential output. It is this situation which, according to inner circles in Washington, may force Mr. Jeffers to carry his case "to the people."

The crux of the situation, obviously enough, lies in which essential military products shall receive the highest priorities. Since the same type of equipment, more or less, is required in plants manufacturing high octane gas, for example, the problem raised is whether the production of such aviation fuel is more necessary to the war effort than the greater production of synthetic rubber. There are other angles: Shall the metal required to build the control and handling equipment needed for synthetic rubber raw materials and copolymer plants be used for such purpose, or is it more important that the metal be directed to shipyards for use in the construction of ships of the line and the machinery needed to operate them?

Many arguments have been advanced on both sides of the fence. Rubber Director Jeffers intimates that since the synthetic rubber to be manufactured will be used for the production of materials needed by the same military agencies which are now combating the higher priorities he asks, and unless such priorities are received the industry will be unable to furnish these materials when needed most in late 1943 and 1944, the military authorities are defeating their own purpose. On the other hand, the military authorities argue that unless there is sufficient shipping available they could not transport the finished rubber products to the fighting fronts.

It is this question of shipping, according to Arthur Krock, ace reporter of the *New York Times,* that is the real reason behind the reticence of the military authorities to have top priorities given to the full synthetic rubber program at the expense of other military programs. In a recent special article Mr. Krock indicates that the effective submarine warfare being conducted by the Nazis lies at the base of the entire controversy which has been turned over to Stabilization Director Byrnes for a decision. The submarine problem, according to the article, is far from licked at the moment, and anti-submarine weapons must be constructed with all possible speed. Although Nazi submarines are being sunk steadily, reports seemed to indicate that the Germans are building them at a greater rate than we are destroying them at present.

The military authorities, again according to Mr. Krock, advance another argument. They claim that the production engineers have under-estimated synthetic plant capacity and that, for example, a plant designed to produce 30,000 tons of synthetic rubber will probably produce 35,000 or 40,000 tons with the same equipment. The experience has been frequent that industrial plants soon produce more than the advance estimates. They go even further and state that, if necessary, they will still further reduce their rubber requirements in 1943.

We fully appreciate the fact that Rubber Director Jeffers, in his straight, forceful manner, is doing his very best to meet the recommendations contained in the Baruch Committee report, which he has adopted as his "bible." But that report also stated that "the military men must decide what things come first in war production," which considerably strengthens the position of these authorities. Perhaps Stabilization Director Byrnes will find a suitable solution to the problem. Perhaps it might be a wise move to reconvene the Baruch Rubber Committee to have them review their recommendations based on the immediate situation!

# CURRENT NEWS OF THE MONTH

## JEFFERS GIVEN COMPLETE AUTHORITY TO ALLOT RUBBER TO ALL CLAIMANT AGENCIES

COMPLETE authority to allot rubber among all claimant agencies, military and civilian, was conferred on Rubber Director William Jeffers with the issuance of Amendment 1 to WPB Regulation 1 as Amended July 9, 1942. The amendment, signed by Donald Nelson, WPB Chairman, was issued on January 5. The order gives Mr. Jeffers complete control over distribution of the nation's rubber supply, including all allocations and apportionments from the rubber stockpile. Mr. Jeffers has sought this authority ever since his appointment as head of the Office of the Rubber Director last September.

The latest directive vests in Rubber Director Jeffers the power to issue, administer, and if necessary to amend or repeal orders regulating the production, distribution and use of rubber and rubber products. It does not, however, include the authority to control the distribution of materials used in the production of rubber. Specifically, the order states that the Rubber Director shall have the following authority:

1. To allot rubber among the War Department, Navy Department, Maritime Commission, Aircraft Scheduling Unit, Office of Lend-Lease Administration, Board of Economic Warfare, Dominion of Canada, the Domestic Requirements Section of the Office of Rubber Director, and any other public or private agency authorized to act as a Claimant Agency before the War Production Board, and also to allot rubber for civilian requirements.

2. To allocate and apportion rubber among the users thereof, including all allocations and apportionments from the rubber stockpile.

3. To issue, administer, and, where necessary, amend or repeal new orders regulating the production, distribution and use of rubber and rubber products, and to amend, repeal and supersede any existing orders heretofore issued by the War Production Board regulating such production, distribution and use, provided, however, that all existing orders of the War Production Board affecting such production, distribution or use shall remain in effect until specifically amended, repealed or superseded. The authority hereby delegated shall not include authority to regulate or control the distribution of any material or products other than rubber and rubber products, even when such other materials or products are for use in the production of rubber.

It also is provided that the Rubber Director may exercise these powers either in his own name, through the WPB Director General for Operations, or through such other official, agency or person as he may designate.

### *Definition of "Claimant Agencies"*

Claimant agencies act as spokesmen for the various "customers" using critical materials. They are responsible for making up and presenting their respective programs and compiling requirements of materials to meet them. This is being done both for current requirements and for future requirements to be submitted under the controlled materials plan, when it becomes effective April 1.

Each claimant acts as proponent of its own program and carefully examines the programs of others. In this way views of all interested parties are expressed. After full discussion of the programs and requests of the respective claimants, the chairman of the Requirements Committee, with the advice of the committee, makes allotments of materials to meet definite approved programs.

The original claimant agencies were the Army, Navy, Air Forces, Maritime Commission, Office of Civilian Supply, Lend-Lease and Board of Economic Warfare.

### *Limitation Disappoints Jeffers*

Rubber Director Jeffers is understood to have been keenly disappointed in the limitation applying to the control of distribution of materials used in the production of rubber contained in the order giving him authority to allot rubber to the claimant agencies. Mr. Jeffers recently stated that the synthetic rubber program faced "catastrophe" unless outright priority were granted for 65 or 70% of its plant construction needs.

Most of the agencies competing with the Rubber Director for materials are among the major claimants for the rubber supplies available. Accordingly, it has been pointed out that if the synthetic rubber program is endangered through lack of critical materials for equipment, the rubber needed by these other agencies would be lacking. The rival claimants, however, stoutly maintain that their production tasks rank with the rubber program in importance and that their priority claims merit consideration on an equal footing.

It has long been generally known that the priority demands raised by Rubber Director Jeffers clashed with those required for the expansion of production of high octane gasoline and with the needs of the military and maritime programs. The problem has been carried to the White House and James F. Byrnes, Director of Economic Stabilization, acting as President Roosevelt's agent, has it under consideration.

At this writing (January 14) a ruling on the priority conflict is pending. It has been reported that Mr. Byrnes has effected a compromise which will expedite completion of a large part of the synthetic rubber program, but no indication has been given as to exactly how much of that program would receive top priorities under the expected ruling. Although Mr. Jeffers has asked that 65 to 70% of the program be rushed to completion to avoid the possibility of a rubber shortage later in the year, it is believed that no more than 60% of construction facilities will secure top priorities, with some circles using a 50% figure only.

### *Changes in Control Orders*

Ever since the original issuance of Supplementary Order Nos. M-15-b and M-15-b-1 amendments have flowed in a liberal stream. It was natural, therefore, that the trade expected complete revisions of both orders sooner or later. These revisions were announced and issued on December 28, and every rubber manufacturer is urged to secure and study the revised orders thoroughly. The amended orders took effect on January 1, 1943.

The changes in M-15-b are designed primarily to reduce unnecessary paper work, to clarify certain definitions, and to correct other minor points. Major changes made in this order include the following:

1. To permit the importation from Canada of rubber products manufactured in Canada, in the United States or in the British Isles. As Canada has placed stringent restrictions on the manufacture and disposition of rubber products, free movement across the border will eliminate a great deal of paper work without providing a loophole for evasion of regulations.

2. To permit the importation of bicycle tires mounted on used bicycles included in the personal effects of any person entering the United States. More than 100 cases of this kind have required individual handling. As bicycle tires are not rationed within the country there is no reason why they should be stopped at the border.

3. To permit the importation of rubber products by diplomatic representatives of foreign governments or members of their staffs for personal use.

4. To permit the importation of scrap rubber by the Army, Navy or Maritime Commission.

5. The monthly report form, PD-322 according to the order before revision, is changed to Form PD-649. The latter already is in use.

6. The definition of latex is changed from "rubber solids" contained in liquid latex to "dry latex solids" contained. The latter is more easily determined and is the same for all practical purposes.

7. Revision of language to permit fixing of quotas of reclaimed or scrap rubber for groups of products in Schedules II-A and II-B for those who do not request or are not granted crude rubber or latex for such purposes.

8. Substitution of the word "regulations" for "specifications" throughout the order.

On January 8, WPB issued Amendment 1 to Supplementary Order M-15-b, as Amended, eliminating the requirement for individual reports covering the consumption of rubber for each war order to be filled. The usual monthly report form, PD-49, on rubber acquired, consumed and on hand, has been revised to include quantities of rubber used to fill orders for each qualified war agency, thus relieving the industry of the burden of filing the monthly reports. It is believed the monthly reports will suffice, as Schedule IV of the order contains a list of restricted products, and what constitutes a qualified war order is assumed now to be fully understood by the industry.

### *Changes in Order M-15-b-1*

Complete specifications for the manufacture of 31 classes of rubber products are contained in the new Supplementary Order M-15-b-1, as Amended. Numerous changes have been made in these regulations (which, unfortunately, space limitation does not enable us to publish in full), covering the manufacture of the following specific products:

(1) Mechanical rubber goods; (2) Conveyor, elevator and flat transmission belts and V-belts; (3) Hose; (4) Packing; (5) Dam and lock gate seals; (6) Hog scraper (beater) paddles; (7) Loom pickers; (8) Milk and milking machine equipment; (9) Pipe coupling rings; (10) Press die pads; (11) Printing rubber products; (12) Rubber-lined tanks, drums and rubber-protected industrial equipment; (13) Abrasive implements; (14) Mine and industry safety parts; (15) Brake lining, brake blocks and clutch facings; (16) Rubber-covered rolls, except domestic washing machine wringer, printers', finger print and business machine rolls.

(17) Soles, taps, sheet soling, toplifts, heels and heel bases; (18) Industrial occupational protective clothing; (19) Hard rubber products; (20) Rubber insulating tape; (21) Rubber footwear; (22) Tires, tire casings, camelback, capping stock, and tire and tube repair materials; (23) Tire and tube repair materials; (24) Tires and tire casings, except airplane and bicycle tires; (25) Tire tubes, except airplane and bicycle tire tubes; (26) Truck tire flaps; (27) Insulated wire and cable; (28) Feeding nipples; (29) Airplane tires and tire casings; (30) Camelback, capping stock, filler strip, stripping stock, padding stock, cushion stock, lug stock, and base stocks; (31) Medical and surgical rubber goods.

A correction to the new M-15-b-1 was issued by WPB on January 1. The correction appears in Subdivision (b) of List 29 attached to the order and changes the description of high pressure landing wheels, 30x7-16 from 6 ply to 8 ply.

### *Substitutes Under Price Control*

Increasingly widespread use of rubber substitutes has resulted in the production of numerous new articles. These new articles had to be submitted to OPA for pricing. To relieve manufacturers of this necessity, OPA issued Amendment 2 to Maximum Price Regulation 220 (Certain Rubber Commodities). The amendment, effective January 4, will enable manufacturers to determine maximum prices for new lines of rubber products utilizing substitute materials.

The term "substitute rubber" is defined to mean "a substance made in whole or in part by a chemical process or from natural gums, resins or oils which in physical properties sufficiently resembles natural or synthetic rubber to replace either of them for particular uses including uses where only some and not all of the physical characteristics of natural or synthetic rubber are needed, and which serves the same use as natural or synthetic rubber in the particular application in which it is applied."

So as to define the regulation's scope more clearly, the amendment lists the articles which, when made in whole or in part of rubber, shall be governed by MPR 220. The regulation specifically provides that it shall not apply to commodities for which a maximum price is in effect under the provisions of any other price regulation, other than GMPR, issued, or which may be issued, by the Office of Price Administration. Manufacturers selling the articles listed are advised by the amendment to make sure, before pricing their products in accordance with MPR 220, that the articles are not covered by other regulations.

Specifically, but not exclusively, the amendment is not applicable to commodities for which maximum prices are established by the following: MPR 136—Machines and parts, and machinery services; MPR 157—Sales and fabrication of textiles, apparel and related articles for military purposes; and MPR 188—Manufacturers' maximum prices for specified building materials and consumers' goods other than apparel.

Articles specifically listed in the new amendment, divided into categories, follow:

Apparel—Aprons, bathing supplies (including bags, belts, capes, coats, shoes, and bathing suits), brassieres, corsets, dress shields, garters and armbands, girdles and elastic girdle blanks, make-up capes, ponchos, raincoats and rainsuits, suspenders, and waterproof capes, cloaks, hats, jackets, leggings, overalls and sleeves.

Bicycle tires and tubes.

Cements and adhesives made in whole or in part of natural, synthetic, reclaimed or balata rubber, but not substitute rubber.

Coated fabrics, including but not limited to artificial leather, automobile upholstery, awning cloth, backing cloth, gummed sign cloth, hospital sheeting, raincoat cloth, rubber welting, rubberized canvas, shoe fabrics, "suede" fabrics, tire covers, topping, and winter fronts.

Latex and latex covered products—Backing of carpets, jute bags, rugs, sacks and wallpaper, and baskets, buckets, dippers, frames, funnels, measures, racks, screens, sponge upholstery, and traps.

Stationer's goods—Chair cushions, desk angle protection strips, desk tops, erasers, pen sacks, pencil plugs, rubber bands, rubber stamps, telephone cord guards, telephone ear pieces, telephone stands, typewriter feet, and typewriter keys.

Tire repair materials.

Miscellaneous items—Air bags and curing tubes used in vulcanizing tires and repairing tubes, balloons for radio and weather observations, cable wrapping tape, diving suits, elastic webbing, mechanical rubber goods, made in whole or in part of balata, the rubber content of which is more than 50 per cent balata; rubberized curled hair, shower-bath curtains, and tarpaulins.

### *Regulate Reclaimed Rubber Sales*

Under the terms of Amendment 2 to Price Schedule 56 (Reclaimed Rubber), issued by OPA on December 31, sales of reclaimed rubber of all types except that produced from scrap products containing synthetic rubber are brought under a single price regulation. Heretofore the price schedule applied only to sales of red tube reclaim and reclaim of a grade and quality the same, or comparable to, that sold by the manufacturer to the same purchaser or a purchaser of the same class during the period November 5 to December 5, 1941.

Maximum prices for other sales of reclaimed rubber, including sales by sellers who were not in business during the November 5-December 5, 1941, base period, have been regulated heretofore under the General Maximum Price Reg-

ulation or under M.P.R. 220—Certain Rubber Commodities. OPA made it clear that prices are not affected, since the new amendment provides that ceilings already established under the supplanted regulations are to continue for the items brought under Price Schedule 56.

Sellers of reclaimed rubber not heretofore covered by Schedule 56 were required to report their prices to OPA in Washington by January 6 showing the following: (1) Grade or grades of the scrap rubber used in producing the reclaimed rubber; (2) Rubber hydrocarbon content; (3) Specific gravity and color of the reclaimed rubber; (4) Maximum price and the method by which it was determined.

### *Lift Balata Price Restrictions*

Price ceiling restrictions on the sale of balata by the Rubber Reserve Co., now the chief importer and distributor of this increasingly important rubber, were lifted by OPA on December 19 with the issuance of Amendment 48 to Supplementary Regulation 1. Deliveries by others of balata rubber completing sales which were exempt from price control before December 19 were also exempted.

Action in this instance was taken, according to OPA officials, pending issuance of specific balata price ceilings. These cannot be established equitably under the General Maximum Price Regulation because Rubber Reserve was not engaged in selling balata in March, 1942, the base pricing period, and does not have a "most closely competitive seller." Rubber Reserve has been selling balata at prices substantially below the March, 1942, level for private dealers. Balata currently finds its widest application in belting.

## RUBBER FOOTWEAR

Three orders affecting rubber footwear have recently been issued. One, Amendment 5 to M.P.R. 229, makes provision for the payment of transportation costs in addition to maximum prices on the delivery of Victory line rubber footwear bought at wholesale or retail. This move brings the regulation into conformity with industry practice.

The amendment, chiefly applicable to sales at wholesale, provides that sellers shall not require purchasers to pay a larger proportion of transportation costs in the delivery of Victory line footwear than was required in the delivery of similar footwear during the most recent normal selling season. For sales at wholesale, this period is April 1 to October 25, 1941, and for retail sales the period is July 1 to October 25, 1941. The order was effective December 29.

The second order was Amendment 6 to Ration Order 6 (Men's Rubber Boots and Rubber Work Shoes). The amendment, issued and effective December 16, provides for simplification of reports required of manufacturers, wholesalers and retailers. The changes include the elimination of some reports and the adoption of a shorter form for the report required of manufacturers.

The amendment also permits manufacturers to transfer rationed footwear items in limited quantity to wearers for experimental "wear-testing" purposes without collecting rationing certificates from the wearer. In such cases, the manufacturer must retain title to the footwear.

Amendment 7 to the rationing order, issued December 21 and effective December 26, was the third order affecting this field. This amendment makes lumbermen who need laced rubber boots (pacs) eligible for rationing certificates of this type of footwear which previously had been exclusively reserved for miners. In issuing the regulation, OPA made it clear that the extension of eligibility for the pacs, designated as Type 5 in the rationing order, was made possible by the Office of the Rubber Director in agreeing to allocate an additional supply of rubber.

## DRUG SUNDRIES

Two new regulations—M.P.R. No. 300 and M.P.R. No. 301—establishing maximum prices at all distribution levels for rubber drug sundries, both effective February 1, were announced by OPA on January 17. Ceilings for the "Victory" line of sundries are specified in dollars and cents and manufacturers must stamp each article or its container with the maximum retail price. Ceilings on sundries not included in "Victory" line are moved back to prices asked a year ago.

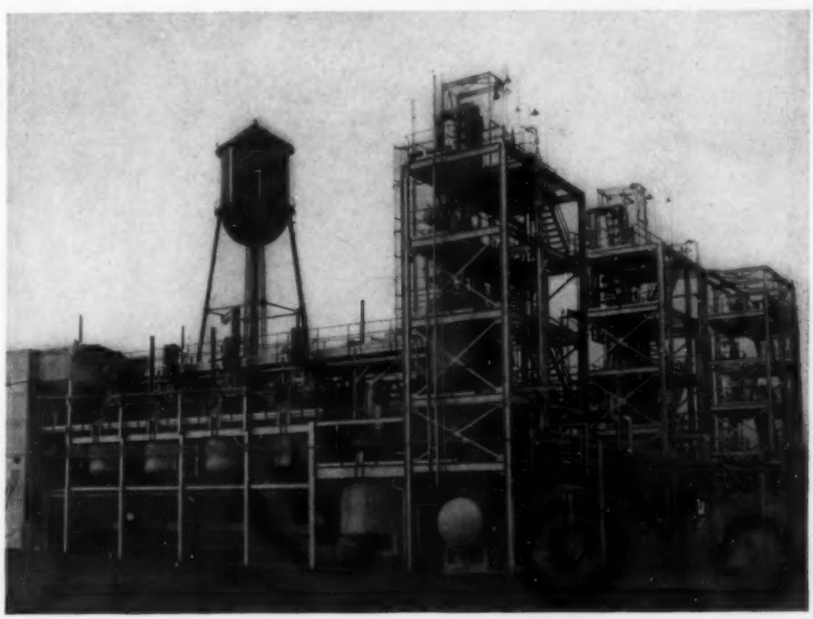
Of particular interest to wholesalers and retailers is an arrangement which in effect establishes maximum dollars and cents prices at those levels for all drug sundries. This is accomplished through a provision that all price calculations for the sundries, except for the "Victory" line, and those sold to mail order houses, must be made at the manufacturing level. Manufacturers must indicate such maximum retail and wholesale prices either by giving written notice or by marking the article or its container.

## PRESSURE SENSITIVE TAPE

As a means of conserving vitally needed crude rubber, the Conservation Division of WPB has endorsed and urged the use of non-rubber pressure sensitive (adhesive) tape for masking plastic airplane glass to prevent scratches or damage during shipment. Crude rubber pressure sensitive tape, which consumes thousands of pounds of crude rubber monthly, has been used for this purpose.

High grade reclaim rubber pressure sensitive tape was first suggested as a slightly less critical alternate. It was found unsatisfactory, however, because a residue remained on the glass after the tape was removed, requiring the use of a solvent which reacted with the plastic glass.

Non-rubber pressure sensitive tape composed of vegetable oils and resins was then considered as a possible non-critical substitute. At the request of the Conservation Division, the Bureau of Standards conducted tests using this non-rubber tape on plastic airplane glass. These were duplicates of tests set up and conducted by the plastic glass industry. In one test the tape was placed on plastic glass for a period of three days at 40



*A view of the first synthetic rubber plant put into operation in the Government's program. This plant is located at Akron and is being operated by Firestone.*

degrees Centigrade. The result of this test as reported by the Bureau of Standards indicated that the non-rubber pressure sensitive tape when subjected to these conditions left no residue when removed from the plastic glass.

An extended test for 11 days at the same temperature showed a residue remaining on the glass when the tape was taken off, all of which could be removed with a dry cloth requiring no solvent and with no harm to the plastic glass. The new tape has been found satisfactory in actual practice by a number of manufacturers.

### RUBBER HEELS

Rubber heels made to the specifications of Government procuring agencies but rejected by any such agencies because of defects that have no effect on their serviceability have been priced for domestic sale at all levels from manufacturer to consumer. The action was taken in Amendment 4 to M.P.R. 200 (Rubber Heels, Rubber Heels Attached, and Attaching of Rubber Heels), the amendment being issued January 11 and effective January 16.

Volume of the heels rejected by war agencies is not great, but no pricing provision for their sale in the domestic market had been made in the regulation. Those made after the effective date of MPR 200, September 1, 1942, are covered in the amendment. They are made from whole tire reclaim, and in spite of small defects they are equal in quality to civilian rubber heels being made before September 1, 1942. Therefore, they have been graded and priced by manufacturers' brand names exactly as are heels made before that date. When sold for civilian use their containers must be marked "war reject."

## GILLETTE COMMITTEE CONTINUING SYNTHETIC RUBBER INVESTIGATION

The Senate Agricultural Subcommittee, headed by Senator Gillette of Iowa, which conducted a thorough investigation of the synthetic rubber situation last year, has no intention of dropping its investigation in the new Congress and, in fact, has already launched a continuation of its hearings. Senator Gillette still terms the situation as "confusing and chaos" and warned that there will be additional Congressional action to guarantee more adequate rubber production. The subcommittee is particularly interested in securing greater production of butadiene from grain-alcohol.

Appearing before the subcommittee on December 16, Rubber Director Jeffers explained that his organization has been assigned a very difficult job, *i.e.*, that of preventing a collapse of the domestic economy by keeping the nation rolling on rubber. He said that every effort is being made to follow closely the recommendations of the Baruch report but that "synthetic rubber plants must be built immediately without consideration for alcohol plants."

Testifying before the subcommittee on the same date, Deputy Director Bradley Dewey told the Senators that a month's delay in the development of the synthetic rubber program would leave rubber supplies "below the danger line by late next summer." Col. Dewey gave the subcommittee information on the number and type of synthetic rubber plants under construction. He is also reported to have revealed that most of the completed synthetic plants are only producing about 2% of their total capacity.

According to Col. Dewey, the rubber requirements of the United Nations in 1943 will amount to 577,000 tons, as follows: *Military*, 325,000 tons; *Private Transportation*, 3,000 tons; *Commercial Transportation*, 59,000 tons; *Other Civilian Uses*, 49,000 tons; *Foreign Countries*, 117,000 tons; and *British Deficiency*, 24,000 tons.

Later, in a special statement, Rubber Director Jeffers said that construction necessary to guarantee "essential" rubber in 1944 is being delayed by "red tape" and lack of priorities and the program faces failure unless the "green light" is given. How serious this situation is can be appreciated by the fact that the priorities question has been brought to the attention of the White House, as reported elsewhere in this issue.

According to Mr. Jeffers, complete Government approval of 65 to 75% of the synthetic rubber facilities now would mean production of about 600,000 tons in 1944. This rubber, he added, would be required for military uses and essential transportation and motorists would have to depend on production from the 30 to 35% of construction earmarked for the future, probably about 1945. Top priorities for the construction of about 20% of the program was recently given, it was revealed.

As has been previously reported, one of the synthetic rubber plants in Kentucky is already being operated by Goodrich. Two additional plants to be operated by Goodrich are nearing completion in Texas. Other plants under construction are located in Pennsylvania, West Virginia, Louisiana, California and Mississippi. Goodyear will operate the California plant when completed. These plants are all in addition to those being operated by Goodrich and Firestone in Ohio and U. S. Rubber in Connecticut.

#### *Revive Vetoed Rubber Bill*

The rubber bill which was passed by Congress last year, which provided for the creation of a rubber supply agency to have complete jurisdiction over the production of rubber made from grain-alcohol, was reintroduced in the House on January 8 by Representative Andresen of Minnesota. This is the bill which was vetoed by President Roosevelt and which indirectly led to the appointment of the Baruch Rubber Committee.

Various Senators are known to be planning the introduction of a similar bill but it is now considered doubtful whether this bill would call for the creation of a separate rubber agency, particularly in view of the fact that Senator Gillette seems to be in sympathy with the problems faced by Rubber Director Jeffers in the fulfillment of the recommendations made by the Baruch Committee. In some circles it is believed that if the original bill passed by Congress last year did not include the creation of a special agency it might have received a better reception by President Roosevelt.

#### *Organize the Copolymer Corp.*

On January 4 it was announced that the Rubber Reserve Co. has awarded a contract to the Copolymer Corporation for the operation of one of the new Government-owned plants to be built in Louisiana. This corporation, like that of the National Synthetic Rubber Corp. revealed last month, was organized for the sole purpose of operating one of the copolymer plants in the overall synthetic rubber program.

Whereas the National Synthetic Rubber Corp. was organized by a group of general rubber products manufacturers, the Copolymer Corporation has been formed by a group of six of the smaller tire companies and Sears, Roebuck & Co. The tire companies include: Armstrong Rubber Co., Dayton Rubber Mfg. Co., Gates Rubber Co., Lake Shore Tire & Rubber Co., Mansfield Tire & Rubber Co., and the Pennsylvania Rubber Co. Sears-Roebuck is one of the world's largest distributors of private-brand tires and, in addition, has a financial interest in the tire plant operated by the Armstrong Tire & Rubber Co. at Natchez, Miss.

While no details have been issued by the principals involved as to the capacity of the plant to be operated, it is believed that the new unit, which will probably be completed sometime this year, like the unit to be operated by the National Synthetic Rubber Corp., also to be located in Kentucky, will secure its butadiene from the Standard Oil Co. of Louisiana. One of the Standard Oil butadiene units in Louisiana was scheduled for completion by the end of last year and another is scheduled for operation by next March.

Officers of the new Copolymer Corporation follow: *President*, A. L. Freedlander (President, Dayton Rubber); *Vice-Presidents*, James A. Walsh (President, Armstrong Rubber), M. H. Clarke (Vice-President, Lake Shore Tire), George W. Stephens (President, Mans-

field Tire), and C. W. Yelm (Vice-President, Gates Rubber); *Secretary*, F. M. Judson, (Supervisor, Tire Division, Sears-Roebuck); *Treasurer*, Howard W. Jordan (President, Pennsylvania Rubber). C. M. Hulings, formerly with the American Cyanamid Co., has been appointed vice-president and general manager of the new corporation, the technical staff of which will be furnished by the various principals involved.

### *DuPont Making Thiokol*

Shortly after the Baruch Committee report was made public, one of the recommendations of which called for the production of 60,000 tons of Thiokol N per year, Thiokol N being suitable for tire retreading, rumors began to float around to the effect that DuPont might arrange a deal with the Thiokol Corporation under which the former would manufacture Thiokol N in one of its temporarily idle plants. It has since been learned that this deal has been negotiated and DuPont will produce 24,000 tons of the 60,000 tons recommended.

### *Rubber Mission to Russia*

As reported in our last issue, a special four-man committee to investigate the Russian method of producing synthetic rubber was recently appointed. It has since been revealed that this committee is composed of Ernest W. Pittman, president of the Interchemical Corporation, who will act as chairman, and Dr. Willis A. Gibbons, director of development, U. S. Rubber Co.; Dr. Aristid Von Grosse, who has been engaged in war research work for the Office of Scientific Research and Development at Columbia University; and Irvin L. Murray, chief process engineer, Carbide & Carbon Chemicals Corp. These men have already left for Moscow by plane. Dr. Grosse, who has lived in Russia, will act as interpreter.

Members of the Senate Agricultural Subcommittee which has been investigating the synthetic rubber program were highly critical of the selection of the committee because "these men know little or nothing about production of rubber from agricultural products." Rubber Director Jeffers stated that he had been guided largely in his selection by Deputy Rubber Director Bradley Dewey and Col. Dewey, in turn, defended the selection, stating that the group included one of the greatest exponents in the world of making butadiene from alcohol, *i.e.*, Mr. Murray.

The decision to send the rubber mission to Russia was made in compliance with the recommendation made by the Baruch Committee which severely criticized administrative officials for not having learned a great deal more of the Russian methods before launching a large-scale synthetic rubber program in this country. The mission, it is reported, will require several months and will investigate all aspects of synthetic rubber manufacture in Russia where it has been a large industry for some years. It is expected that the Russians in return will send a similar mission to the United States to investigate American techniques and processes, particularly for the manufacture of GR-S (Buna S).

### Rubber from Blood and Bones

The development of a process to make a rubber substitute from the blood, bones and other waste materials of livestock is claimed by Ralph A. Stark, a chemist of Minneapolis, Minn. The material, which Mr. Stark calls "neoflex," is said to be in commercial production, and is already being used in the production of sandblast stencils used in cutting granite. Experiments are being conducted on the use of the new material for tire boots and lining for paper cartons to replace tin containers. As used in sandblast stencils, "neoflex" is said to stand "two times as much abuse as rubber."

### *Restrict Chemical Shipments*

Manufacturers of butadiene, styrene and acrylonitrile may now supply only small amounts of these materials to customers over and above their quota allotments, according to the terms of General Preference Orders M-178, M-170 and M-153, all as amended January 9, 1943.

Under the terms of these orders a producer may deliver each month on small orders one-quarter of 1% of the amount of material he is specifically authorized to deliver under allocation restrictions. Small orders are 125 pounds or less in the case of butadiene and 50 pounds or less in the case of styrene and acrylonitrile.

The amended orders also contain provisions which require that in making application for any of these materials standard forms PD-600 and PD-601 be used instead of the special PD-33 form previously required. Form PD-600 is due on the 15th day of the month and PD-601 on the 20th under each of the amended orders.

### *Synthetic Reclaim Price Exempt*

Price ceilings have been removed from reclaimed synthetic rubber by the issuance of Amendment 49 to Supplementary Regulation 1 of the General Maximum Price Regulation. The amendment was issued by OPA on January 1. The decision to exempt reclaimed synthetic rubber, of which there is little available at present, from price control is based on the same reasons which caused such rubber in its original form to be exempted.

Important among these reasons is the fact that the reclaiming of synthetic rubber is a new industry, and it is desirable that development of various reclaiming techniques be free of price restrictions during the formative period.

It is expected that lower prices will go along with increased experience, and in any case price control will be imposed when conditions warrant. At the moment, it was pointed out, volume is small, and therefore prices of rubber products will not be disturbed because of the absence of price control over reclaimed synthetic rubber.

At the same time, OPA clarified the existing price ceiling exemption for synthetic rubber itself by defining the term as follows: "A material obtained by chemical synthesis, possessing the approximate physical properties of natural rubber, when compared in either the vulcanized or unvulcanized condition, which can be vulcanized with sulfur or other chemicals with the application of heat, and which, when vulcanized, is capable of rapid elastic recovery after being stretched to at least twice its length at temperatures ranging from 0°F. to 150°F. at any humidity."

## BUTADIENE

Arguments over the use of critical materials to convert oil refineries as originally proposed have delayed their production of butadiene for the synthetic rubber program, according to testimony given by Bruce K. Brown, Assistant Deputy Petroleum Administrator for War, before the Senate Agricultural Subcommittee on January 6. He claimed that if officials had given the eventual conversion projects the "green light" when the refiners and gasoline manufacturers first proposed them, "they would have been in operation many months prior to the best completion date which can be predicted for a wholly new plant."

Mr. Brown defended the conversion program as a whole. He reported that a new Cities Service Co. refinery and butadiene plant would be completed on schedule in Louisiana by next October and asserted that there is no tendency on the part of the larger oil companies to seek improvised plants through conversion but that they regarded such plants as "necessary evils" to help meet the critical needs for rubber.

Asked whether the $2,815,000 alloted for materials for the refinery conversion plant of the Standard Oil Co. in California was not too high, especially in view of the fact that conversions in other parts of the country run from $138,000 to $865,000 only, Mr. Brown stated that the cost was high, but it was caused by the desirability of making synthetic rubber in California from natural butane which required "an unusually high proportion of new equipment."

The conversion of industrial alcohol plants from molasses to grain alcohol production, which was originally scheduled for completion by the first of the current year, is also reported to be lagging and it now appears that such con-

version will not be accomplished before the summer. Although the whiskey industry is now going full blast on war production it, too, has not been fully converted to alcohol production as per schedule. Most of the distilleries are said to be producing only high wines (distilled spirits of high alcoholic content), but the alcoholic content is not high enough for use as industrial alcohol needed for the butadiene portion of the synthetic rubber program.

According to testimony given before the Gillette subcommittee on January 5, facilities to produce industrial alcohol will be completed and operating at sufficient capacity to meet all industrial needs, including that of synthetic rubber, by the end of 1944. The testimony was given by Dr. Walter G. Whitman, head of the Alcohol Section of WPB who added that by that time the demand will be between 590,000,000 and 640,000,000 gallons annually. That demand, and any future demand, can be met by expansion of present facilities, completion of three new plants already authorized in Nebraska, Missouri and Iowa, and construction of other new plants in the Midwest for which surveys are being completed, and utilization of a 54,000,000-gallon stockpile now on hand.

Dr. Whitman stated that 1943 needs may approximate 510,000,000 gallons, of which 200,000,000 gallons would be used for the production of butadiene for synthetic rubber and the rest for smokeless powder, military uses, and anti-freeze solutions. Synthetic rubber production, he said, will require twice as much grain alcohol in 1943 as it did in 1942 and this alcohol will be shipped to eleven butadiene plants now under construction, the first of which, in Kentucky, will begin production in February.

Earlier, on December 20, the WPB Chemicals Division announced a program of engineering in advance for a series of war alcohol plants, the construction of which will depend upon need. Plans for the individual plants will be completed and then "laid on the shelf" until needed. These plants, which include the three "authorized" plants referred to by Dr. Whitman, if built, will be a part of the 100,000,000 gallon increase in industrial alcohol capacity recommended by the Baruch Rubber Committee. The plants would be based on a new design recently approved by the engineering advisory committee of the Alcohol and Solvents Section of the Chemicals Division and its own engineering staff, each plant having a capacity of 10,500,000 gallons a year.

A three-way program to increase the production of industrial alcohol for war purposes was also recently announced by the Department of Agriculture. Under this plan, Government-owned wheat will be sold to flour millers for manufacture into granular flour for sale to distillers. Experiments have shown that granular flour (a free-flowing, hard wheat flour) yields more alcohol than either corn or corn-wheat mixtures. Another advantage is that production of granular flour will utilize the grinding facilities of millers instead of requiring new installations by distillers. Possibly 50,000,000 bushels of Government-owned wheat may be used in this program during 1943.

## SHARP INCREASE MADE IN TRUCK TIRE RECAPPING SERVICES

A sharp increase in the quota of truck tire recapping services for January was announced by OPA on December 27 in a move to provide needed recaps for casings now wearing thin on essential vehicles. The allotment for the month is 368,000 compared with 149,520 for December.

The January allotment of Grade I passenger car tires is set at 161,000, compared with 126,097 for December, and the quota of Grade II tires is 230,000 against 368,000, while that of Grade III tires is 690,000 against 92,000. The tire capping quota for passenger car tires for January is 800,000, compared with 887,245 for the previous month, and the passenger car tube quota is 709,336 against 357,272, the latter figures reflecting increasing needs under mileage rationing.

The truck tire quota for January is 345,307 and that for farm tractor and implement tires is 21,000, the December quota for these two classifications being lumped at 340,229, while the tube quota is 335,863 against 143,720. Allotments for farm tractor and implement tires and truck tires have been segregated because rationing boards sometimes had to make decisions between farm machines and commercial machines when the lumped quota was not large enough to meet demands for both types.

### *Idle Tires Near 10,000,000*

According to the latest information, made public on December 21, almost 10,000,000 tires were turned in to the Government under the Idle Tire Return Plan up to December 5. At the same time OPA announced that total stocks of new passenger tires in domestic trade channels as of September 30 were a shade over 9,000,000, compared with normal replacement sales of about 30,000,000 new passenger car tires a year.

The September 30 report of new passenger car tire stocks shows that, of a 9,018,228 total, 6,506,429 were held by Defense Supplies Corporation, manufacturers and mass distributors, while dealers that have reported thus far held 2,511,799.

The reports show total stocks on September 30 were actually at a higher level than was shown in the admittedly incomplete inventory that was hastily compiled in the weeks immediately following the attack on Pearl Harbor a year ago. Estimates based on reports received from the trade at that time had placed the inventory above 8,000,000 passenger car tires.

New truck tire inventories with some dealer's reports not yet received totaled 1,636,232 as of September 30. Of this inventory 1,036,812 were held by Defense Supplies Corporation, manufacturers and mass distributors, and 599,420 were on the shelves of reporting dealers.

Of a 9,870,864 September 30 inventory of passenger car inner tubes, 6,844,117 were held by DSC, manufacturers and mass distributors and 3,026,747 by reporting dealers. Dealers reported 627,531 truck tubes on hand September 30, while DSC, manufacturers and mass distributors had 1,436,571, making a total of 2,064,102.

None of the September 30 inventory figures include tires turned in by motorists to DSC under the Government's idle tire purchase plan, which was not put into effect until October 15.

### *To Sell Excess Tires*

The excess tires acquired by the Idle Tire Return Plan will soon be made available to motorists who need them for essential driving, OPA announced on January 9. It has been decided to permit the sale of these tires beginning January 20. Holders of A and B cards who can show essential need for replacement tires are expected to be the principal applicants for such tires.

In a speech made in Omaha, Nebraska, on December 3, Rubber Director Jeffers indicated that car owners might have to give up their spare tires and it might be necessary to take tires from persons who own more than one passenger car if the synthetic rubber program as now set up does not meet full war needs. He emphasized the point, however, that it looked as if the program would prove adequate, in which case such drastic measures would not have to be carried through.

Mr. Jeffers also stated that of the approximate 10,000,000 tires turned in as a result of the Idle Tire Return Plan about 40% of them could be used for scrap only, some 30 to 35% were worth recapping, and the balance were satisfactory for immediate use.

### *Clarifies Rationing Grades*

Motorists who get rationing certificates under the Mileage Rationing Plan entitling them to buy Grade III tires may choose between any of the three kinds of casings in that grade—used tires, recapped tires or all-reclaim tires—according to a decision announced by OPA on December 21.

STANDARD MICRONEX
THE FAST CURING GOOD PROCESS-ING, MEDIUM CHANNEL BLACK
MICRONEX
A COLUMBIAN COLLOID
200 TONS OF SMOKE A DAY
COLUMBIAN CARBON COMPANY
BINNEY & SMITH CO. • COLUMBIAN CARBON CO.
DISTRIBUTOR
MANUFACTURER

# STANDARD MICRONEX

Designed to impart maximum reinforcement consistent with high speed processing, Standard Micronex represents balance in rubber black. Presenting an available surface of more than 10 acres per pound the use of Standard Micronex assures adequate reinforcement in combination with fast curing, good processing and only moderate heat build-up.

Users of Standard Micronex have found it entirely practical for compounding with reclaimed and synthetic rubber. Where cure retardation must be avoided, as with Butyl rubber, the fast vulcanizing properties of a black such as Standard Micronex are quite essential.

# FURNEX

*Contributes* — High loading capacity • Easy and smooth processing • Improved aging • Low hysteresis • Resilience and notable extensibility

# STATEX

*Develops* — Reinforcement — equal to Standard Carbon Black Cool Running — due to high rebound and less hysteresis • Better Curing — high pH promotes vulcanizing • Electrical Conductance—essential in airplane tires and other military specialties.

***Samples and literature available***

**BINNEY & SMITH CO. • COLUMBIAN CARBON CO.**

DISTRIBUTOR MANUFACTURER

Similarly, the holder of a certificate authorizing purchase of a Grade II tire may buy any in that category, which includes casings with a retail ceiling price less than 85 per cent of the price for a standard first line tire; all new tires manufactured before January 1, 1938; "factory seconds" so marked by the manufacturer; damaged new tires; and tires that have gone less than 1,000 miles but enough to wear off the mold marks.

Motorists granted Grade I certificates may buy any new tire whose ceiling price is 85 per cent or more of the maximum for a standard first line casing. If they wish, they may buy Grade II tires.

A Grade I or Grade II certificate holder, however, is not permitted to buy a Grade III tire. But if either wishes to buy one of the lowest grade, he may go to his rationing board and exchange the certificate he holds for one entitling him to buy a Grade III casing.

### *Inspection Deadline Extended*

Changes in the periodic tire inspection program intended to minimize public inconvenience and smooth out occasional work peaks for qualified inspectors were announced by OPA on January 12. Under the revised plan, motorists have been given an extension of time beyond the present January 31 deadline for the first inspection and subsequent inspections will be less frequent.

A stagger system will be put into effect so that there will be three different deadlines, one for motorists with only "A" mileage ration books, another for holders of "B" books, and the third for those with "C" rations. Holders of "B" and "C" books or bulk coupons for fleets now have until the end of February to secure initial inspections while "A" holders have until the end of March.

Thereafter, holders of "A" books will be required to undergo inspection every six months instead of every four months as originally proposed, while "B" inspections will be required every four months and "C" inspections every three months. Previously, the regulations called for holders of "B" and "C" coupon books to have their tires examined once every two months.

### *Pricing of Reclaim Tires*

An alternative pricing method for manufacturers of passenger car tires made of reclaimed rubber was provided by OPA on January 6 with the issuance of Amendment 3 to M.P.R. 143 (Wholesale Prices for New Rubber Tires and Tubes). The new method is intended for use where the previously established pricing method does not allow a sufficient operating margin.

The basic pricing method for the all-reclaim "war" tire established in the original regulation required a manufacturer to determine his wholesale selling price by applying his March, 1942, discounts to the recently established dollars-and-cents maximum retail prices.

Where this pricing method provides a ceiling which is less than 45 per cent of the retail ceiling, the manufacturer now may determine his price by using the same procedure established for pricing tires sold by manufacturers to private brand distributors—that is, adding a percentage mark-up to the factory cost of the tire being priced. The method of calculating the factory costs and the proper percentage mark-up are set forth in the regulation.

The amendment also (1) increases maximum wholesale prices of "war" tires of the General Tire & Rubber Co.; (2) supplements the formulas heretofore contained in the regulation by providing that a seller who cannot determine his maximum prices through use of the formulas shall use the maximum prices of the most comparable seller and (3) directs that any sale under a cost plus contract shall be priced under the provisions applicable to sales by manufacturers to private brand owners.

## RETREADING EQUIPMENT

Existing restrictions on the production and sale of new tire retreading and recapping equipment are now applicable also to used equipment. The new regulations are contained in General Limitation Order L-61, as Amended December 17, 1942. Other changes in the order, designed to halt acquisiton of this scarce equipment by speculators and to insure proper distribution, were made by:

1. Extending applicability of restrictions on manufacture and distribution to all persons, and

2. Allowing transfer, sale or other distribution of new and used retreading equipment by written or telegraphic authorization of the Director General for Operations without preference rating.

All of the changes were incorporated in paragraph (b) of the order.

Still further changes in these regulations were announced on December 23. Preference ratings for the manufacture, sale or purchase of equipment now will be issued on PD-200 certificates, in addition to PD-1-a, PD-1-x and PD-408. Form PD-200 is used for new projects, and since many new projects for tire retreading and recapping facilities contemplate the purchase of machinery and equipment, it will obviate separate authorization.

In addition, the latest amendment excludes from the provisions of the order tube repair or spot equipment having a retail value of $100 or less and tire spreaders having a retail value of $25 or less, provided that purchases shall not be split to qualify under this exception.

According to a ruling by OPA on December 29, dealers in retreaded and recapped tires who do not possess their own equipment and must have the work done by other recapping establishments may not pass on to their customers resulting transportation charges. The ruling stated that such charges are part of the dealer's costs of doing business.

## TUBELESS TIRES

Although the tubeless tire has "large potentialities for rubber conservation" it apparently offers "little or no help for the present rubber emergency," according to a report issued on January 13 by the Transportation Committee of the Petroleum Industry War Council. The report was made after a month's operating road tests by oil companies on more than 1,000 tubeless tires in all parts of the country.

The report disclosed that most of the tires which were either new or in A-1 condition operated successfully without tubes, but that older and poorer tires failed in many of the tests which, admittedly, must be considered inconclusive because of the short period of testing involved. The suggestion was advanced that the tests be continued by the Office of the Rubber Director, the Office of Defense Transportation, and the rubber industry itself.

It has also been revealed that John B. McGay, the Tulsa, Oklahoma, manufacturer who is sponsoring the tubeless tire idea, has approved the method by which the inner liner is vulcanized to the casing. Several companies are said to be working on inner liners made of substitute materials, one or more of which will be adopted by Mr. McGay. If such inner liners are used, it is claimed, tubeless tires will be foolproof because air will not be able to diffuse through even the shoddiest casing.

# SPECIAL AGREEMENT SIGNED WITH BRAZIL ON CRUDE RUBBER

The plan to transport 50,000 workers to the Amazon Valley to increase rubber production to about 50,000 tons a year, most of which will go to the United States, revealed in our last issue, became a reality on December 22 when a special agreement was signed in Rio de Janeiro by representatives of the Rubber Reserve Co. and the Office of the Brazilian Coordinator. The agreement calls for the setting up of bases for the men's travel and for their transportation by any available means—air, rail, truck, boat and afoot.

According to the agreement, the Brazilian Coordinator expects to have the 50,000 men working in the Valley by May, 1943, and about 30,000 more by the end of the year. In all, it is hoped to have about 100,000 tappers at work by December of this year and, based on the production of one ton of rubber by every

two tappers, at least 50,000 tons will be produced. Up to the middle of December, over 13,000 workers had emigrated to the rubber fields.

An investigation has been launched in Brazil to determine whether fires in the Amazon Valley which have been destroying rubber trees in growing volume recently are the result of spontaneous combustion from intense solar heat or the action of saboteurs. Occasional fires have always occurred in the jungle, but never in such volume and with such frequency as of late. Because the greatest destruction is occurring around Manaos and the Yaco and Pupus Rivers region, thickly populated by Japanese, the belief prevails that sabotage is responsible.

As has been previously reported, the Brazilian Government is establishing several regional agricultural institutes, one of which is located at Belem in Para. Through the Department of State, the National Bureau of Standards of the U. S. Department of Commerce has been requested to assist in equipping the Belem laboratory and developing a research program.

Norman Bekkedahl, of the Bureau's rubber section, has already gone to Belem where he will serve as Chief of the Rubber Technology Division of the Instituto Agronomico do Norte. Fred L. Downs, research rubber chemist formerly with the American Steel & Wire Co., has joined him as assistant. Mr. Downs was at one-time connected with the Bureau of Standards and before joining American Steel & Wire in 1935 had worked with the Thermoid Rubber Division of the Thermoid Co., at Trenton, N. J. Before Dr. Bekkedahl left the states he ordered practically all the equipment needed to establish a modern rubber research and testing laboratory.

### *Other Countries Active*

Colombia and Peru are also reported to be making big strides in their respective rubber programs. The little town of Leticia, capital of Colombia's remote Amazonas region at the headwaters of the Amazon River system, is reported to be mobilizing every available worker to reopen long-abandoned trails leading to the thousands of rubber trees in the region. These reports say that manpower in the Amazonas region is being organized so completely for rubber gathering that a possible shortage of food may soon present a new problem.

From Peru comes the report that Cuzco, ancient seat of the Inca Empire is being linked by a new highway with the Marcapata gold mines, but rubber rather than gold will soon be the most important product moving along this road. The new road will provide access to the lowlands east of the high Andes where millions of rubber trees offer an additional source of crude rubber. A revival of the rubber industry promises to give new life to the economy of the region.

Considerable progress on crude rubber collection is reported also from Ecuador.

*Dr. John McGavack (right) in charge of research on domestic rubber-bearing plants for the U. S. Rubber Co., is examining Kok-Sagyz roots at the company's experimental plantation in Bergen County, N. J.*

This country, smallest of those on the west coast of South America, has become the second largest source of tree rubber among the countries to the south. Rubber production in Ecuador for 1942 is reported to be the highest on record, although no statistics have been revealed. In 1941, Ecuador produced about 1,500 tons of rubber, compared with 17,500 tons for Brazil, her big neighbor.

Progress toward the formation of an Indian Rubber Production Board is reported from India. The Board will have the task of encouraging the maximum production of rubber by intensification of tapping, new planting, improved horticultural methods, and scientific research. A Rubber Production Commissioner will be appointed, and a Rubber Purchase Office will be established at Cochin.

Restrictions on new planting have been removed, it is reported, and the possibilities of various rubber-bearing plants are being investigated. The Imperial Council of Agriculture is experimenting with guayule and *kok sagyz* seeds from the United States and Great Britain.

Increased or improved tapping of existing trees is seen as the only solution to the problem of obtaining a quick increase in Indian rubber production.

### *Tires Are Being Exported*

It was revealed on December 30 that the Board of Economic Warfare is permitting tires to be shipped to four or five of the Latin American countries. BEW officials explained that the shipments are "in line with our policy to share with Latin America our shortages as well as our surpluses." This share-and-share-alike agreement, it was said, stems from the policy expounded by Sumner Wells, Assistant Secretary of State, at the Rio conference held early in 1942.

How many tires are being exported and to what countries was not disclosed. But officials emphasized that the number allowed to leave this country is restricted to meet the "minimum essential needs" of recipient countries. In addition, the importing nations have been required to put into operation a rationing and conservation system similar to that in effect here and board officials make sure that only minimum requirements are supplied.

### *Report on Kok-Sagyz*

On January 6 the U. S. Rubber Co. revealed that the first crop of rubber from *Kok-Sagyz* grown on its small experimental plantation in New Jersey was harvested. The plants are based on seeds secured from Russia and cultivated under the auspices of the Department of Agriculture.

According to Dr. John McGavack, who is in charge of domestic rubber growing research for the company, the seeds have done "very well" in New Jersey where they were planted on an acre of ground on July 20. The first harvest indicates that the state's climate is quite good.

The plants were gathered with spades instead of scythes, since most of the rubber content of *Kok-Sagyz* is in the roots. The roots keep growing in the frozen ground long after the leaves have been killed by frost.

## ELECTRICAL DEVELOPMENTS IN THE SYNTHETIC RUBBER FIELD

Some interesting information on the design and installation of electrical equipment in copolymer plants and plants supplying the essential raw materials for the new synthetic rubber industry is contained in a review of "1942 Electrical Developments in the Chemical Industry" prepared by the General Electric Co. The portion of the review pertaining to synthetic rubber follows:

The 1,000,000 ton per year synthetic rubber, or "elastomer," industry, essentially a brand new creation of the year 1942, is expected to go into operation early in 1943. The Buna S synthetic rubber part of the program comprises about 75 per cent of the industry. This industry actually consists of four separate and distinct divisions:

1. Power houses for the generation of electric power and the very large quantities of process steam required.
2. Butadiene plants. These are very similar to refineries.
3. Styrene plants.
4. Polymerization plants where the raw materials, butadiene and styrene, are polymerized into the Buna S type of rubber.

### *Data on Power Plants*

The power plants now being installed in this industry include a 40,000-kilowatt steam turbine in a butadiene plant in the East, two 25,000-kilowatt steam turbines in a combination refinery and butadiene plant in the South, and a 35,000-kilowatt steam turbine in a butadiene plant in the Southwest. These power plant installations represent only those plants where it has been found feasible to skim electric power from the steam before sending it to the process. In a large part of the remainder of this industry, only low-pressure boilers will be installed and steam will go directly to process.

Representative of the steam conditions in these power plants are those of the 35,000-kilowatt unit, which receives steam at 725 lb. gage, 725 F., and discharges 950,000 lb. per hour at 165 lb. gage and 250,000 lb. per hour at 425 lb. gage. A considerable amount of this discharge steam from the main turbine is run through mechanical-drive turbines, driving various auxiliaries and pumps before it is discharged at approximately 15 lb. gage directly into the process.

There are several hundred such mechanical-drive turbines driving auxiliaries and pumps in several of these butadiene plants. Since the Rankin efficiency of the large 35,000-kilowatt turbine is about 80 per cent and that of the small 100-hp. mechanical-drive turbine may be as low as 40 per cent, this means that the same steam allowed to expand in the large turbine to the final process pressure will produce something over twice the kilowatts or horsepower.

The widespread use of the small mechanical-drive turbine in these industries at this particular time requires an explanation since their use is exactly counter to the trend to use electric motors for such drives wherever possible. The principal reasons for their use are their availability and the saving of copper. Other reasons are ease of obtaining adjustable speeds and the requirements of 15 lb. process steam in the immediate neighborhood of the drive.

These points are emphasized because of the unusual conditions prevailing. The installed cost of the small mechanical-drive turbine is approximately forty dollars per horsepower as against about thirty-five dollars per horsepower for electric motors where an electric distribution system already exists. In addition, about one horsepower is lost for each horsepower installed, due to the lower Rankin efficiency of mechanical-drive turbines. It is expected, therefore, that the trend to install electric motor drive will be resumed after the present unusual conditions have passed.

About half of the kilowatts generated by the large synthetic rubber plants will be returned to the public utility systems, while the remainder will be used in adjoining butadiene and polymerization plants. In one case, at least, some of the process steam will go to a polymerization plant erected in conjunction with a butadiene plant. The large majority of the steam requirements are, however, in the butadiene plant.

Speed in erecting plants is more essential now than is obtaining the last Btu, but it can be expected that after the war considerable refinement along the lines of heat balance and heat utilization will take place in synthetic rubber plants.

## LIFE RAFT DESIGNED AS EQUIPMENT FOR FLYING FORTRESSES

An improved seven-man rubber life raft, which will give aviators forced down at sea greatly added protection and comfort, including a square-rigged sail, was recently demonstrated by the U. S. Rubber Co. The new raft, depicted above, was designed by the company in conjunction with the Equipment Laboratory of the A. A. F. Materiel Center at Wright Field, Ohio, and will be put into use on our Flying Fortresses. It will extend the length of time flyers can remain alive at sea.

The new design, based on the experience of those who have been rescued at sea after spending weeks in inflatable boats, not only gives more space, but makes the boat less tippable and more seaworthy. A fabric sea anchor is used to keep the nose of the boat into the wind and thus reduce the possibilty of tipping caused by heavy seas. Two 10-foot lengths of rope are tied on opposite sides of the boat to aid in "righting" the raft if it inflates wrong side up or is overturned.

Dimensions of the raft are approximately 12 feet long and 5 feet 8 inches wide, and weight, complete with equipment, is only 70 pounds. Deflated, it rolls into a carrying case 3 feet long by 1½ feet in diameter. The top is orange-yellow for quick visibility and the bottom blue to avoid attracting sharks. A horizontal bulkhead divides the boat into upper and lower chambers so that the entire boat will remain inflated though pierced by a shark or other object from the bottom. A sail is provided as well as a tarpaulin.

## J. INGMANSON AND F. CONOVER HEAD NEW YORK RUBBER GROUP

John H. Ingmanson, of the Bell Telephone Laboratories, Murray Hill, N. J., and Fred Conover, of the Naugatuck Chemical Division of U. S. Rubber Co., Naugatuck, Conn., were elected chairman and vice-chairman, respectively, of the New York Group, Rubber Division, A.C.S., at the annual Christmas Party and Meeting of the group held at the Building Trades Club in New York City on December 18. Approximately 415 members and guests were in attendance. B. B. Wilson (*India Rubber World*) was elected secretary-treasurer, and Joseph Breckley (Titanium Pigment), sergeant-at-arms.

Elected to the Executive Committee to serve three-year terms were W. B. Dunlap, Jr. (Lee Tire), D. A. Comes (Farrel-Birmingham), and A. H. Eufer (R. T. Vanderbilt). In accordance with a recent decision of the committee, the retiring chairman, F. E. Traflet (Pequanoc Rubber), automatically became an ex officio member of the committee, in addition to the retiring secretary-treasurer, Peter P. Pinto (RUBBER AGE). Other members of the Executive Committee include the following: *One Year Terms*—R. E. Casey (Naugatuck Chemical), L. Edland (Rodic Rubber), and G. J. Wyrough (Whitehead Brothers); *Two Year Terms*—H. G. Bimmerman (DuPont), J. W. Crosby (Thiokol), and O. J. Lang (Armstrong Rubber). K. J. Soule (Manhattan Rubber) was chairman of the Nominating Committee.

### *Paid Membership Reaches 565*

In opening the meeting, retiring chairman Traflet announced that up to the date of the meeting the paid membership totaled 565. He then listed 14 present and former members of the group who are now in military service, as follows: J. L. Buckley (U.S. Rubber), D. E. Cable (U.S. Rubber), William Y. Duncan, Jr. (Akron Standard Mold), LeRoy Dyal (Georgia Kaolin), John M. Hamilton (Binney & Smith), L. H. Hitchcock (General Electric), B. J. Lemon (U.S. Rubber), Charles G. MacDonald (R. T. Vanderbilt), F. J. Maywald, Henry P. Pryor (R. T. Vanderbilt), Sherman S. Rogers (Pequanoc Rubber), D. C. Scott, Jr. (Henry L. Scott Co.), and H. M. Walter (Container Co.). Subscriptions to both RUBBER AGE and the *India Rubber World* have been entered for all of these men in the service through the courtesy of the group.

During dinner, entertainment was furnished by two attractive female accordionists while a male pianist led the crowd in community singing. After dinner, 30 minutes of "Streamlined Magic" was presented by H. Walter Grote of the United Carbon Co. Mr. Grote presented several new novelty tricks from his extensive repertory and as usual was well received. Following this portion of the program, some 150 prizes were distributed to holders of lucky number tickets. These prizes, which ranged from gift cartons of cigarettes to radios, were made possible by donations received from the following companies:

Advance Solvents & Chemical Corp., Akron Standard Mold Co., L. Albert & Son, American Cyanamid & Chemical Corp., American Resinous Chemicals Corp., Anaconda Sales Co., Barrett Division of the Allied Chemical & Dye Corp., Binney & Smith Co., Black Rock Mfg. Co., Godfrey L. Cabot, Inc., Callaway Mills, Carter Bell Mfg. Co., Cleveland Liner & Mfg. Co., Continental Carbon Co., E. I. du Pont de Nemours & Co., Inc., Farrel-Birmingham, Inc., Flintkote Co., General Atlas Carbon Division of General Properties Co., Inc., Givaudan-Delawanna, Inc., C. P. Hall Co., J. M. Huber, Inc., Hycar Chemical Co., *India Rubber World*, I. B. Kleinert Rubber Co., Midwest Rubber Reclaiming Co., Monsanto Chemical Co., Moore & Munger, H. Muehlstein & Co., Inc., National Rubber Machinery Co., National Sherardizing & Machine Co., Naugatuck Chemical Division of U. S. Rubber Co., New Jersey Zinc Co. Pequanoc Rubber Co., Philadelphia Rubber Works Co., Pittsburgh Plate Glass Co. (Columbia Chemical Division), Rare Metal Products Co., Revertex Corp. of America, John Royle & Sons, RUBBER AGE, St. Joseph Lead Co., A. Schrader's Son Division of Scovill Mfg. Co., A. Schulman, Inc., Henry L. Scott Co., Southwark Mfg. Co., Stamford Rubber Supply Co., Stanco Distributors, Inc., Standard Chemical Co., Stauffer Chemical Co., Sun Oil Co., Textile Proofers, Inc., Thiokol Corp., Thompson, Weinman & Co., Inc., Titanium Pigment Corp., United Carbon Co., U. S. Rubber Reclaiming Co., R. T. Vanderbilt Co., Vansul, Inc., C. K. Williams & Co., Wilmington Chemical Corp., Wishnick-Tumpeer, Inc., Xylos Rubber Co.

### Detroit Holds Christmas Party

More than 200 members and guests attended the Christmas Party of the Detroit Rubber & Plastics Group, Inc., held in the Jade Room of the Detroit-Leland Hotel in Detroit, Mich., on December 11. A turkey dinner was served and door prizes, made possible by donations from the rubber and plastics field, were distributed. M. A. Clark, Michigan director of the War Manpower Commission, who for many years was personnel director of the Detroit plant of U. S. Rubber, delivered an address clarifying the duties and scope of the Commission. At the conclusion of his address, the speaker answered numerous questions.

### Akron Meets on January 22

The Winter Meeting of the Akron Group, Rubber Division, A.C.S., will be held on January 22 at the City Club in Akron, Ohio. P. F. Robb, of the Hercules Powder Co., will deliver an address on "Modern Plastics." Dinner will be served promptly at 6:45 P.M. Tickets are $2.00 each.

## BUFFALO RUBBER GROUP ELECTS WETHERBEE, WILEY AND CYPHERS

The annual election of officers held at the combined Meeting and Christmas Party of the Buffalo Group, Rubber Division, A.C.S., at the Hotel Westbrook in Buffalo on December 16 resulted in

**Burt Wetherbee**
*heads Buffalo Rubber Group*

the following selections: *Chairman,* Burt W. Wetherbee (Globe Woven Belting Co.); *Vice-Chairman,* Howard L. Wiley (U. S. Rubber Reclaiming Co); *Secretary-Treasurer,* Norman J. Cyphers (Hewitt Rubber Co.). J. M. Cranz (Spray-Dip Rubber), H. E. Elden (Dunlop), and John S. Plumb (U. S. Rubber Reclaiming) were elected to the Executive Board.

Approximately 80 members and guests attended the meeting which, in addition to the election of officers, featured an entertaining musical show, headed by Art Leard, popular master of ceremonies of Buffalo, and the distribution of prizes to holders of lucky number tickets. The prizes were made possible by donations received from the following companies:

Akron Chemical Co., L. Albert & Son, American Cyanamid & Chemical Corp., American Zinc Sales Co., Binney & Smith Co., Godfrey L. Cabot., Inc., Callaway Mills, J. M. Cranz Co., Chevrolet Gear & Axle Division of General Motors, Inc., Continental Carbon Co., Farrel-Birmingham Co., Inc., Hercules Powder Co., Hycar Chemical Co., *India Rubber World,* International Smelting & Refining Co., James O. Meyers Co., Monsanto Chemical Co., H. Muehlstein & Co., Inc.

New Jersey Zinc Co., Philadelphia Rubber Works Co., Pequanoc Rubber Co., Rolls Chemical Co., RUBBER AGE, A. Schulman, Inc., Henry L. Scott Co., Stanco Distributors, Inc., Standard Chemical Co., Thiokol Corp, Titanium Pigment Corp., U. S. Rubber Reclaiming Co., R. T. Vanderbilt Co., Xylos Rubber Co.

**BUY BONDS AND STAMPS**

## CLARKE AND HAAS NAMED TO LEAD BOSTON RUBBER GROUP

Lawrence R. Clarke, of the Haartz-Mason-Grower Co., Watertown, Mass., and Joseph L. Haas, of the Hodgman Rubber Co., Framingham, Mass., were elected chairman and vice-chairman, respectively, of the Boston Group, Rubber Division, A.C.S., at the meeting held on December 11 at the University Club in Boston, Mass. Harry A. Atwater (Hood Rubber) was elected secretary-treasurer, and L. D. Ackerman (Converse Rubber) and J. Geenty (Reading Division, Sanford Mills) were elected to the executive committee. Approximately 185 members and guests attended the meeting.

Carbon black was the theme of the technical session, with papers on "pH Surface Area and Structure of Carbons" and "Carbon Reenforcement of Synthetic Rubbers" delivered, respectively, by Harold A. Braendle and Dr. Carl W. Sweitzer of the Columbian Carbon Co. The speakers were introduced by Charles R. Haynes, of the Binney & Smith Co.

Dr. Sweitzer showed some remarkable electron microscope slides illustratting blacks of the whole carbon range which embraces blacks with a particle size of below 20 millimicrons up to the soft blacks ten times as large. The tendency of some of these blacks to form chains of particles or to have structure was emphasized. Mr. Braendle used a large number of slides to show the reenforcement given by carbon blacks of different particle size in Buna S, Buna N, Thiokol and neoprene. A lecture and presentation of colored motion pictures on "Wanderings in the Peruvian Andes, the Land of the Incas," by Harry J. Robinson, noted traveler, rounded out the program.

The balance of the evening was devoted to the distribution of prizes to holders of lucky number tickets. These prizes, including war stamps and bonds, were made possible by donations received from the following:

L. Albert & Son, American Cyanamid & Chemical Co., American Resinous Chemicals Corp., American Zinc Sales Co., T. C. Ashley & Co., Binney & Smith Co., Stewart Bolling & Co., J. T. Baker Chemical Co., Carter Bell Mfg. Co., Boston Rubber Group, Boston Woven Hose & Rubber Co., Brockton Machine Co., Godfrey L. Cabot, Inc., D. R. Campbell Machine Co., Cleveland Liner & Mfg. Co., Continental Carbon Co., Converse Rubber Co., James Cunningham, James B. Cunningham Co., Dicalite Co., E. I. du Pont de Nemours & Co., William D. Egleston Co.

Eustis, Pennock & Co., H. T. Feinberg & Sons, Inc., C. E. Gale Co., General Atlas Carbon Division of General Properties Co., Inc., General Electric Co., Hird & Connor, Inc., Hodgman Rubber Co., Hood Rubber Co., J. M. Huber, Inc., Ralph Huber Co., Hycar Chemical Co., Imperial Paper & Color Corp., Innis-Speiden & Co., Ernest Jacoby & Co., Krebs Pigment & Color Corp., D. H. Litter Co., Mallinckrodt Chemical Works, Malrex Chemical Co., Monsanto Chemical Co., H. Muehlstein & Co., Inc., Naugatuck Chemical Division of U. S. Rubber Co., New Jersey Zinc Co., Niagara Sprayer Co., A. C. Nispel, Inc.

Panther-Panco Rubber Co., Pequanoc Rubber Co., Phillip Bros., Inc., Plymouth Rubber Co., RUBBER AGE, Sanford Mills, A. Schrader's Son, A. Schulman, Inc., Henry L. Scott Co., Simplex Wire & Cable Co., Stamford Rubber Supply Co., Stanco Distributors, Inc., Thiokol Corp., Wm. R. Thropp & Sons Co., Titanium Pigment Corp., Turner Halsey Co., Tyer Rubber Co., United Carbon Co., R. T. Vanderbilt Co., Vansul, Inc., Weller Chemical Co., L. G. Whittemore, Inc., Charles T. Wilson Co., Wishnick-Tumpeer, Inc., Xylos Rubber Co.

## Coming Events

**Jan. 22.** Akron Rubber Group, City Club, Akron, Ohio.

**Feb. 2.** Los Angeles Rubber Group, Mayfair Hotel, Los Angeles, Cal.

**Feb. 12.** Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

**Feb. 12.** Rubber & Plastics Group, Montreal Section, Society of Chemical Industry, Faculty Club, Montreal, Canada.

**Feb. 18.** Buffalo Rubber Group, Joint Meeting with Western N. Y. Section, A.C.S., Buffalo, N. Y.

**Mar. 24-26.** Ninth Annual Chemurgic Conference, Drake Hotel, Chicago, Ill.

**Apr. 12-16.** Spring Meeting, A.C.S., Detroit, Mich.

**Apr. 30.** Buffalo Rubber Group, Joint Meeting with Ontario Rubber Group, Niagara Falls, Ontario, Canada.

### Chemurgic Group to Meet

The Ninth Annual Conference of Agriculture, Industry and Science, under the sponsorship of the National Farm Chemurgic Council, will be held at the Drake Hotel in Chicago on March 24 to 26. The program, including that portion which will be devoted to rubber, will be announced shortly. The Council makes its headquarters in Columbus, Ohio.

### Chicago Group to Hear Neal

Arthur M. Neal, Assistant Director, Rubber Laboratory, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware, will deliver an address on "Accelerators and Buna S" at the next meeting of the Chicago Group, Rubber Division, A.C.S., to be held on February 12 at the Morrison Hotel in Chicago.

## FUN AND FROLIC FEATURE CHICAGO GROUP'S XMAS PARTY

Following the pattern set in previous years, the Annual Christmas Dinner and Dance of the Chicago Group, Rubber Division, A.C.S., held in the Terrace Casino of the Morrison Hotel in Chicago on December 18 was devoted in entirety to fun and frolic. The affair was attended by approximately 325 members, their wives and guests, who, after an excellent dinner, were royally entertained by six acts of vaudeville, headlined by "The Three Make Believes."

James P. Sheridan (N. J. Zinc) and Robert C. Gunther (Inland Rubber) acted as chairman and co-chairman of the committee in charge of the dinner-dance. They were ably assisted by Daniel Siefer (Diamond Wire & Cable), George Gates (Victor Mfg. & Gasket), J. T. Adams (Sears-Roebuck), and William Crumpler (Mephan Co.). The party was made possible by contributions received from the following companies:

Advance Solvents & Chemical Corp., L. Albert & Son, American Container Corp., American Resinous Chemicals Corp., American Zinc Sales Co., Armstrong Tire & Rubber Co., Robert A. Atwood, Auburn Rubber Corp., Baker-Perkins, Inc., Bibb Mfg. Co., Binney & Smith Co., Callaway Mills, Carter Bell Mfg. Co., Chicago Belting Co., Chicago Rubber Clothing Co., Cleveland Liner & Mfg. Co., Commerce Petroleum Co. Continental Carbon Co., Cupples Co., Darling & Co., Diamond Wire & Cable Co., Dicalite Co., Dryden Rubber Co., E. I. du Pont de Nemours & Co., Inc., Farrel-Birmingham Co., Inc., Frost Rubber Works, General Atlas Carbon Division of General Properties Co., Inc., Genseke Bros., Goshen Rubber & Mfg. Co., Great Lakes Solvents Co., R. W. Greeff Co., Inc.

C. P. Hall Co., Herron & Meyer, J. M. Huber, Inc., Hycar Chemical Co., Ideal Roller & Mfg. Co., Industrial Rubber Goods Co., Inland Rubber Corp., International Smelting & Refining Co., Kraft Chemical Co., LaJone Rubber & Mfg. Co., G. C. Maasen, Marbon Corp., Maywood Mold & Machine Co., Geo. S. Mepham Corp., Midwest Rubber Reclaiming Co., Monsanto Chemical Co., Moore & Munger, H. Muehlstein & Co., Inc., National Rubber Machinery Co., National - Standard Co., Naugatuck Chemical Division of U. S. Rubber Co., New Jersey Zinc Sales Co., Pequanoc Rubber Co., Philadelphia Rubber Works.

Rapid Roller Co., Rex-Hide, Inc., Roth Rubber Co., RUBBER AGE, W. H. Salisbury & Co., Inc., Sears, Roebuck & Co., Servus Rubber Co., Stanco Distributors, Inc., Standard Chemical Co., Sun Oil Co., Thiokol Corp., Titanium Pigment Corp., Union Asbestos & Rubber Co., United Carbon Co., U. S. Rubber Reclaiming Co., Van Cleef Bros., Wear-Proof Mat Co., Western Felt Works, Williams-Bowman Rubber Co., Wishnick-Tumpeer, Inc.

# Who's Who in Washington—and Where

## OFFICE OF THE RUBBER DIRECTOR

Rubber Director—William Martin Jeffers.
Executive Assistant—D. O. Churchill.
Special Assistants—Glen R. Ward and Richard Smith.
Deputy Rubber Director—Col. Bradley Dewey.
Special Assistant—Morehead Patterson.
Assistant Deputy Rubber Directors—L. D. Tompkins (operations), E. B. Babcock (technology and specifications for industry uses), R. P. Dinsmore (research and development of synthetics), and Frank R. Creedon (plant construction).
Special Advisors—Dr. E. R. Gilliland and W. L. Campbell.
Manager of Priorities—S. P. Dorsey.
Special Consultants to Mr. Tompkins—Dr. H. S. Rogers, A. L. Freedlander, Willard Helburn, and E. E. Ferebee.
Legal Advisors—B. P. Holland and Thomas Lynch.
Educational Branch—Dr. H. E. Simmons and John M. Ball.
Technical Consultant Section—E. B. Busenberg (reclaimed rubber), V. A. Cosler (neoprene), A. H. Nellen (tires and tubes), C. W. Sanderson (Thiokol and Norepol), and Ralph Wolf (Butyl).
Priorities Officer—Robert T. Williams.
Assistant—Caspar Wister.
Review Unit of Priorities Section—L. H. Ross, G. E. Perry, and Ellsworth Vines.
Analysts of Priorities Section—J. E. Hicks, Sr., Charles A. Dubocq, E. P. Jecusco, George Lawrence, Edward Gehres, M. J. Span, Louis P. Best, E. D. Wooldridge, and E. L. Schmock.
Administrator, PRP Processing Unit—Smith Johnson.
Acting Manager, Allocation Section—R. E. Hengren.
Assistant—F. X. Finnigan.
Supervisor, Appeals Unit, Allocation Section—F. C. Holmes.
Assistant—Edward Sternberg.
Liaison Section—Tom Roberts, B. E. Pollak and G. R. Toney.
Technical Section—C. S. Reynolds (Administrator), Robert C. Dabney, V. R. Grainger, B. F. Hollister, Walter Juve, Arthur Nolan, J. C. Swift, S. C. Compher, and H. Brunner.
Manager, Statistical Section—Harold L. Flanick.
Assistant—Robert Given.
Synthetic Rubber Allocation—W. H. Peterson.
Administrative Officer—Laurence H. Boerner.
Representative, U.S. Army—Capt. R. R. Wieland.
Representative, U.S. Navy—Lt. Leonard K. Firestone.

Note: The Office of the Rubber Director maintains headquarters in the New Municipal Building, 4th and D Streets, N.W., Washington, D. C. Special Note: There have been some recent changes and additions in the personnel of this agency, all of which will be shown in the next issue.

## RUBBER RESERVE COMPANY

Chairman of the Board—Jesse H. Jones.
President—Howard J. Klossner.
Special Assistants—China R. Clarke and Douglas H. Allen.
Assistants—R. B. Bogardus*, T. A. O'Brien and James C. Roberts*.
Vice-Presidents—R. D. Young, J. W. Bicknell*, Henry A. Mulligan and Stanley T. Crossland.
Secretary—M. C. Mulligan.
Treasurer—W. C. Beck, Jr.
General Counsel—Claude E. Hamilton, Jr.
Chairman, Buying Committee—A. L. Viles.
Vice-Chairman, Buying Committee—A. D. Moss.
Head Field Technician—C. B. Manifold*.
Associate—Earl M. Blair*.
Head, Division of Information, Wild Rubber Division—E. G. Holt*.
Administrative Assistants—Curtis E. Anderson*, Richard Baybutt, William G. McCauley, Fred B. Black*, Horace C. Day*, Howard C. Bugbee, John D. Farnham*, George H. King*, Harry Shere*, George W. Sniffin*, Bernard B. Carlin*, Harland J. Corson*, R. S. Walter*, H. R. Merritt*, E. B. Murphy*, Robert G. Walker*, and A. B. Merritt.
Chief, Administration Division—William H. Sullivan.
Technical Consultants—Richard J. Dearborn, Rufus L. Savage, L. T. Carlson, Frederick M. Pyzel, and Henry F. Palmer.
Consulting Engineers—John W. Livingstone and Alfred Johnson.
Rubber Analyst—P. W. Barker*.
Rubber Specialist—L. B. Proctor*.
Purchasing Specialist—L. W. Proctor.
Distribution Specialist—Richard C. Cooke*.
Chief Procurement Specialist—Alexander J. Lockwood*.

Note: The Rubber Reserve Co. maintains headquarters at 811 Vermont Ave., N.W., Washington, D. C., with the exception of the Wild Rubber Division, headed by Vice-President J. W. Bicknell, which is now located in the Normandy Building, 1626 K St., N.W., Washington, D. C. Asterisks indicate members of this latter division.

## GUAYULE EMERGENCY RUBBER PROJECT

Director—Evan W. Kelley.
Associate—Paul H. Roberts.
Assistant—E. L. Perry.
Chief, Division of Administration and Management—L. C. Stockdale.
Chief, Personnel Management—J. R. Nelson.
Chief, Division of Crop Production—L. S. Gross.
Chief, Division of Lands—G. F. Fine.
Chief, Surveys and Investigation—Dr. W. G. McGinnies.
Chief of Engineering—James J. Byrne.
Chemical Engineer—George W. Miller.
Head, Equipment Maintenance—George L. Bouck.
Principal Plant Physiologist—Dr. W. B. McCallum.
Head, Pilot Mill—D. S. Olson.
Head, Soil Surveys—John L. Retzer.
Director of Research—Dr. A. C. Hildreth.
Physiologist—Dr. Hamilton P. Traub.
Geneticist—Dr. Leroy Powers.
Pathologist—Dr. Wm. A. Campbell.
Agronomist—Delmar C. Pingey.
Rubber Technologist—Raiford L. Holmes.

Note: The Guayule Emergency Rubber Project, Forest Service, Department of Agriculture, maintains headquarters in Salinas, California. Most of the personnel listed above are members of the Forest Service, while others are officially members of the Bureau of Plant Industry.

## OFFICE OF PRICE ADMINISTRATION

### Rubber Price Branch

Price Executive—Temporarily vacant.
Chief Counsel—John N. Cole.
Head, Raw Materials Section—Orson H. Hart.
Head, Tire Price Section—Robert V. Mitchell.
Head, Other Rubber Products Section—Everett D. Hawkins.
Head, Industry Analysis Section—George W. Bolton.
Head, Special Projects Section—Kenneth E. Lawton.
Administrative Officer—Arthur F. Schalk, Jr.

### Automotive Supply Rationing Division

Director—Charles F. Phillips.
Legal Counsel—David L. Lloyd.
Head, Field Section—H. C. Butkiewicz.
Administrative Officer—C. A. Kellner.
Chief, Tire Rationing Branch—Robert S. Betten.
Heads, Tire Rationing Branch—R. G. Leeth (Eligibility Section), A. Koehler (Tire Industry Section), J. P. Collver (Research Section), and R. E. Sewell (Quota Section).

Note: The Office of Price Administration maintains headquarters in its own building at 3rd and Independence Sts., N.W., Washington, D. C.

## DIVISION OF RUBBER CHEMISTRY WILL HOLD MEETING IN DETROIT

The Division of Rubber Chemistry of the American Chemical Society will hold its semi-annual meeting next April in conjunction with the 105th Meeting of the parent society which is scheduled for April 12 to 16. At this writing, however, no dates have been selected for the Division meeting and no hotel has been announced as headquarters. The society's meeting was originally scheduled to be held in Indianapolis, but it was recently decided to hold it in Detroit.

According to Charles L. Parsons, secretary of the A.C.S., the Detroit meeting will be a War Meeting and there will be no plant trips and no general entertainment. The usual society banquet and group meals will be held as usual, but the banquet generally held by the Rubber Division is in some doubt and will probably be eliminated. Unless members of any division make advance arrangements for hotel accommodations and return transportation they are advised not to attend the meeting.

For those desiring to submit papers at the meeting of the Rubber Division it is necessary that three copies of an abstract of 200 to 250 words, an estimate of the time needed for presentation, information on the present connection of the author or authors, and the name of the laboratory in which the work was done, be presented to the secretary, Dr. H. I. Cramer, c/o Sharples Chemicals, Inc., 23rd and Westmoreland Streets, Philadelphia, Penna., by February 15. Three copies of the complete manuscript must be submitted to the secretary before presentation. If any papers deal with synthetic rubber or any of its raw materials, then three copies of the completed manuscript must be sent to the secretary not later than March 1.

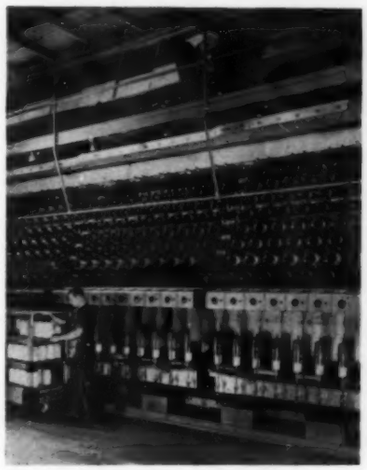
The Board of Directors of the society recently voted the following regulations governing papers to be presented before general, divisional, regional or group meetings: (a) Authorship of papers shall be credited only to individuals and not to companies or laboratories; (b) No paper may be presented which has been offered for publication elsewhere; (c) No paper, no matter how important, may be presented, the title of which does not appear on the final program: (d) If a paper is declined by any division of the society, the secretary of that division is instructed to notify the secretary of any other division to which it is likely to be offered.

### New Plant for Firestone

Firestone Tire & Rubber Co., Akron, has leased a plant in Coshocton, Ohio, for the production of vital war materials. No announcement was made concerning the nature of the products to be made, but it was stated that several hundred people will be employed. The plant was formerly occupied by the Beach Enameling Co.

### Producing High Tenacity Yarn

Industrial Rayon Corporation, one of the world's largest manufacturers of rayon, has announced that it is replacing regular strength yarn production at its



parent plant with high tenacity yarn for tire cord required for aircraft, motorized artillery and army transport vehicles. The company's revolutionary continuous process, which has received considerable attention in recent years, will be used for the production of this tire yarn. While this move will not materially increase the company's total output, it will raise the volume produced by the continuous process by more than 50%, according to the announcement. The Army recently went on record as favoring rayon tire cord because of greater strength and heat resistance.

### Form Wyandotte Chemicals Corp.

Consolidation of the Michigan Alkali Co. and the J. B. Ford Co., its affiliate, into one company to be known as the Wyandotte Chemicals Corp., Wyandotte, Mich., was announced on January 4. J. B. Ford, vice-president and treasurer of Michigan Alkali, has been selected as president of the combined companies. The sales departments of both companies will temporarily maintain their separate identities as divisions of the Wyandotte Chemicals Corp. Michigan Alkali is one of the largest producers of soda ash, caustic soda, calcium carbonate, and other chemicals, while J. B. Ford is one of the world's largest manufacturers of specialized cleaning materials.

### Galley to Discuss Adhesives

Dr. W. Galley, of the National Research Laboratories, Ottawa, Canada, will be the principal speaker at a meeting of the Rubber & Plastics Division, Montreal Section, Society of Chemical Industry, to be held at the Faculty Club in Montreal on February 12. He will discuss "Modern Developments in Adhesives."

## SCHRADER SPONSORS NEW TYPE RUBBER CONSERVATION PROGRAM

As its contribution to the rubber conservation program the A. Schrader's Son Division of the Scovill Manufacturing Co., Brooklyn, N. Y., has launched a program of its own designed to detect and repair leaking tubes before tire punctures occur. The program is based on results ascertained over a period of years proving that almost one-third of all cars in service operate with at least one under-inflated tire. Obviously, less wear will be secured from an under-inflated tire than one properly inflated.

In pursuing their program, Schrader points out that compressed air escapes from inner tubes in two ways, the first entirely preventable and the second unpreventable but detectable. The first method is loss of air through valve leakage. This can be prevented by replacing the removable valve core and screwing on an air-tight cap. The second loss is caused by slow leaks through punctured holes caused by nails, glass, pinches, etc. Despite such punctures, tires can run almost indefinitely for their full life, or until the slight pressure becomes a rip or the intruding object is removed, thereby leaving a hole.

To overcome loss of air through slow leaks, Schrader is advocating a five-point inflation program, as follows: (1) Check tire pressures frequently, making a careful comparison of pressures of all tires (slight variations will occur, but wide variations are abnormal, indicative of a slow leak); (2) Re-inflate lost air pressure at least each week; (3) Inflate tires when cool (since tire pressures increase due to flexing and road friction even in cold weather); (4) Be sure that gauging equipment used is accurate; and (5) Apply sealing tire valve caps to prevent any loss of air at the mouth of the valve.

To encourage this program, Schrader is distributing thousands of copies of a pamphlet entitled "How to Add Miles to Your Tires Now" as well as Tire Pressure Record cards on which accurate pressure records may be maintained for both passenger cars and trucks. The program has been called to the attention of the rubber conservation authorities in Washington and to that of the tire manufacturers.

### Bulletin on Synthetic Rubber

Continuing its efforts to furnish information on various types of rubber to serve as background material for editors, writers and others, the Rubber Manufacturers Association, 444 Madison Ave., New York City, has issued "A Summary of Data on Synthetic Rubber." Like the previous editions, which covered guayule and scrap and reclaimed rubber, the latest bulletin defines the material, discusses various types being made available, covers the historical development, and treats the entire subject in clear, concise language.

# NAMES IN THE NEWS

WALTER J. MURPHY, editor and general manager of *Chemical Industries,* has been chosen editor of *Industrial & Engineering Chemistry* and *Chemical Engineering News,* official publications of the American Chemical Society, to succeed the late HARRISON E. HOWE. He also becomes director of the A.C.S. News Service.

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THEODORE MARVIN, advertising manager of the Hercules Powder Co., Wilmington, Delaware, has been selected as industrial advertising's Man-of-the-Year for 1942 by *Industrial Marketing.* The selection was based on the year-round high standard of the company's advertisements directed to the chemical industries.

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J. R. RAFTER, connected with the research laboratory of the Firestone Tire & Rubber Co., Akron, for the past few years, has left that company to join the Providence Braid Co., Providence, R. I., as chief chemist.

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KENNETH E. NIGHMAN, formerly a sales engineer for the U. S. Rubber Co., has been named manager of public relations for the Detroit, Mich., plant. He has been associated with the rubber industry since 1928, joining Fisk Tire in 1936 and remaining with the company after its absorption by U. S. Rubber.

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J. A. MACMILLAN, chairman of the board, Dayton Rubber Manufacturing Co., Dayton, Ohio, has been named a director of the National Association of Manufacturers.

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F. J. REESE, advertising and sales promotion manager of the Associated Tires and Accessories Division of the B. F. Goodrich Co., Akron, is now sales manager of special accounts of that division, succeeding M. G. HUNTINGTON who has been transferred to the company's national sales and service division office in Washington, D. C.

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DR. THOMAS MIDGLEY, JR., vice-president of the Ethyl Corporation and widely known for his researches in the petroleum, rubber and other fields, has been elected president of the American Chemical Society for 1944.

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W. I. GALLIHER, formerly director of sales of the Columbia Chemical Division, Pittsburgh Plate Glass Co., has been appointed executive sales manager of that division, succeeding ELI WINKLER who is retained in the capacity of executive consultant. MR. GALLIHER makes his headquarters at the general offices of the company in Pittsburgh, Penna.

C. D. BUCHER, formerly purchasing agent for the Mohawk Rubber Co. and prior to that associated with Goodrich as a buyer of engineering materials, has joined the Dayton Rubber Manufacturing Co., Dayton, Ohio, as director of purchases. He is a graduate of Ohio State University and a past president of the Akron branch of the National Purchasing Agents' Association.

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LEE R. JACKSON, executive vice-president, Firestone Tire & Rubber Co., Akron, was appointed to the board of trustees of the University of Akron on January 4. He will fill out the unexpired term of JOHN W. THOMAS, Firestone board chairman, who recently resigned because of the press of other duties.

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WENTWORTH BROWN, manager of production for the Canadian subsidiary of the Brown Co., has been appointed to the same position with the parent American firm, succeeding JOHN D. MCCRYSTLE who has resigned from the company. MR. BROWN, who will make his headquarters at the Berlin, N. H., plant, is a grandson of the founder of the company.

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RAY E. BLOCH, president, Mohawk Rubber Co., and J. P. SEIBERLING, president, Seiberling Rubber Co., were elected trustees of the Akron Better Business Bureau, Inc., last month.

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T. W. Smith, Jr., secretary-treasurer and general manager, Sun Rubber Co., Barberton, Ohio, was re-elected president of the Toy Manufacturers of the U.S.A., Inc., at the annual meeting of the organization held in New York City on December 11. He was also recently elected secretary-treasurer of Akron Air Gliders, Inc.

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E. A. SEELEY, manager of field personnel and training for the B. F. Goodrich Co., Inc., Akron, has been loaned to the Tank and Automotive Center of the Army Ordnance Department at Detroit, Mich., as executive personnel advisor. He has been with Goodrich since 1926.

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D. P. BRANNIN, who has been in charge of metal sales for the N. J. Zinc Sales Co. in the Chicago area, has been appointed district sales manager of the Pigment and Metal Sales Division, with headquarters in Chicago, and J. P. DUNPHY, of the New York Sales Department, has been named district sales manager of the Pigment Division, with headquarters in New York City. Both men have been with the company for more than 25 years.

CLIFTON C. CANDEE, identified with the activities of the Calco Chemical Division of the American Cyanamid Co. since 1934, has been appointed technical service director of that division, succeeding DR. ROY A. SHIVE who recently joined the Rubber Reserve Co. to supervise the production and development of chemicals for the synthetic rubber program.

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A. CLARKE BEDFORD, assistant sales manager of the Standard Oil Co. of New Jersey and its affiliated Esso Marketers, has been named general sales manager of the company, succeeding R. T. HASLAM, recently elected a director of the parent company. He has served in executive capacities with Standard Oil since 1920, at one time heading the Colonial Beacon Oil Co. as president.

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K. D. SMITH, prominent rubber technician with the B. F. Goodrich Co., who has been serving as manager of the company's national sales and service division at Washington, has transferred his headquarters to Detroit, Mich., where he will be principally concerned with problems relating to military tire equipment.

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JAMES W. HARLEY, who started work with the U. S. Rubber Co. as a factory hand at the Passaic, N. J., plant in 1919, has been appointed director of traffic of that company. He succeeds GEORGE F. HICHBORN, who has been with the company for 36 years.

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HARRY A. BAUMAN, manager of the sundries department of the industrial products division of the B. F. Goodrich Co., Akron, retired on December 31 after more than 42 years of service with the company, all of which was spent in the rubber sundries field. He was tendered a farewell party on December 30 and presented with a specially designed "Good Fellowship" folder containing the names of hundreds of associates and friends.

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HARRY E. HOUGHTON, for the past five years general sales manager of the Brown Co., Berlin, N. H., has been elected vice-president in charge of sales. Previous to joining Brown, MR. HOUGHTON was identified with the advertising agency field.

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### New Rubber Preserver

A new rubber preserver, intended to conserve the life of auto and bicycle tires, garden hose, running boards, stair treads and mats, boots and overshoes, and other rubber products, was recently introduced by the North British Rubber Import Co. of America, Inc., 22 Park Place, New York City. Described as a "revolutionary rubber-like compound," the new material is said to help stop rotting, to reduce oxidation, and to retard the deteriorating effects of grease and oil. It is brushed on and readily flows into and fills tiny cracks and bruises, drying quickly to form a tough, air-tight film over the surface.

## WESTINGHOUSE PLAYING ROLE IN SYNTHETIC RUBBER PROGRAM

The important role being played in the synthetic rubber program by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Penn., was recently emphasized in an announcement by the company that it is now working on more than $3,000,000 worth of electrical equipment for 24 key plants in the program. Some of this equipment already has been delivered to these plants, which are being rushed to completion as fast as possible, according to A. C. Monteith, manager of Westinghouse's Industry Engineering Department.

Under present plans the 24 plants, 14 of them producing ingredients and the 10 others combining these ingredients to make Buna S rubber, will have a total yearly production of more than a half million tons of synthetic rubber. Many of the plants are expected to be in production by next March.

The company is furnishing over $2,000,000 worth of turbines, transformers, explosion-proof motors and other apparatus for the 14 plants which will make butadiene and styrene. These two liquids are currently obtained by chemically juggling the hydrogen and carbon atoms in molecules of alcohol or petroleum products. They can be produced from any hydrocarbon source, such as wood or sugar.

Ten other plants which will co-polymerize butadiene and styrene to make synthetic rubber will receive more than $1,000,000 worth of Westinghouse electrical equipment—control centers to route power over 6,500 circuits to the different machines; circuit breakers and other switchgear; electric motors; substations to step the power supply down to the proper plant voltage, and lighting panelboards.

### *Exhaust Steam Heats Stills*

Steam generated at one plant making both butadiene and styrene will perform the triple task of providing electric power, driving production machinery directly and furnishing heat for the chemical processes. For this plant, a 35,000 kilowatt turbine generator is being built costing more than $750,000 and large enough to serve a city of more than 35,000 homes. Less than half the power created by the generator will be required to light the plant and run its 500 electric motors. The excess will be diverted to the lines of a power company for general distribution.

Exhaust steam from the power turbine will have enough pressure left to drive compressor engines which keep the chemicals under pressure while they are being "cracked" in the stills. The exhaust from the compressors will go on to provide heat for the stills. Part of the steam coming out of the boilers will be sidetracked into mechanical drive turbines connected to pumps and fans in the power house.

This particular plant and 13 others producing butadiene or styrene, or both, will also obtain from Westinghouse circuit breakers, switchgear, transformers, electric motors and motor controls and mechanical drive turbines totalling in value more than $1,250,000.

All control centers in the 10 co-polymerizing plants will be supplied by Westinghouse. This is the largest control center job ever furnished to a single industry at one time. These centers, costing approximately $500,000, will direct power to thousands of electric motors running pumps, agitators, driers, compressors and balers.

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### Moldings with Felt Cores

The development of what is claimed to be a new rubber molding technique, by means of which moldings consisting of a core of felt surrounded by a "corral" of rubber are produced, was recently revealed in England. The development is reported to be the result of cooperative research between the Empire Rubber Co. and the Bury Felt Manufacturing Co., prominent British companies in their respective fields. The saving in rubber in some cases is said to amount to as much as 75%. In addition, the moldings are from 30 to 75% lighter than corresponding all-rubber moldings. The producers also claim that variations in the degree of resilience are more easily obtained and controlled than with all-rubber moldings because a felt core of any degree of hardness can be used as required. The name "Relt" has been given to the new product.

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### Building Soft Black Plant

The construction of a new furnace type plant to produce the semi-reinforcing type of black, generally referred to as "soft black," is reported by J. M. Huber, Inc., New York City. The plant is being erected at Borger, Texas, where the company produces its own natural gas for its six channel black units. This gas will also be utilized for the new plant, completion of which is expected toward the middle of the current year.

## SPECIAL RUBBER COURSES OFFERED BY CITY COLLEGE

Two courses on synthetic rubber offered under the Engineering, Science and Management War Training Program of the U. S. Office of Education have been announced by the College of the City of New York, Convent Avenue and 139th St., New York City. Both courses are intended to train persons to operate the butadiene, styrene and copolymer plants in the overall synthetic rubber program.

The first of these courses is in "Elementary Chemical Engineering Calculations" and includes lectures, recitations and problem work. Lectures will be held on Tuesday and Thursday evenings, from 7:30 to 10:30 P.M., starting on January 19. The second is in "Elements of Synthetic Rubber Manufacture," and is primarily a course in physical chemistry. It includes a short description of the chemistry and technology of rubber and is identical with the course on "Plastics, Rubbers and Allied High Polymer Engineering Materials" also given by the College. This second course will be given on Monday and Wednesday evenings, from 7:30 to 10:30 P.M., starting on January 18.

Both of the special courses cover the minimal amounts of physical chemistry and chemical engineering necessary to train chemists to take positions that normally would be filled by chemical engineers. They are intended for people who will be ready to take jobs out of New York after completing the courses, the jobs running to the $2,000-a-year bracket. Women are preferred. The courses are in the hands of Professors A. X. Schmidt and C. A. Marlies, the latter assistant professor of chemical engineering at the College.

The course in "Plastics, Rubbers and Allied High Polymer Engineering Materials," which has been given at C.C.N.Y. for some time under another name, is primarily intended for those actually engaged in the rubber and plastics industries. The course runs for 8 weeks, 2 nights a week, and covers the manufacture, properties and applications of the various polymers. Prerequisites to the course include completion of third year in an engineering college or a Bachelor's degree with college specialization in chemistry or practical experience in the field.

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### Flexible Aviation Engine Mounts

New flexible aviation engine mounts developed by the Goodyear Tire & Rubber Co. to cushion the engines on rubber are being adapted to Army training planes, according to Goodyear officials. Tests are reported to be under way by the Army Air Corps to enable the use of another cushioning method but following the same principle for the engines of heavier military planes, such as bombers.

### Anaconda Denies War Fraud

Any knowledge of the alleged failure of the Anaconda Wire & Cable Co. to meet Government specifications in the manufacture of materials for the war effort has been disclaimed by the executives of that company in a statement issued by H. R. Keresey, president of the company.

Anaconda and five of its employees were indicted by a Federal grand jury at Fort Wayne, Ind., on December 21, charged with conspiracy to defraud the United States by circumventing test and inspection requirements on Government contracts as a result of which defective wire and cable intended for combat use was delivered to the Army Signal Corps and to the Navy.

The indictment listed Thor S. Johnson, general manager of all Anaconda mills; Frank E. Hart, division manager; Don R. Carpenter, plant superintendent; Chalmer Bishop, chief inspector; and Frank Kunkle, assistant chief inspector, the last four being stationed at the Marion, Ind., plant.

According to the indictment, the defendants "secretly" installed a transformer or circuit-breaker on the testing equipment and by "secretly" manipulating this equipment during tests they were able to "pass" inferior or defective material which had only 220 megohms of resistance instead of the 2,200 megohms or more required. In denying the allegations, the Anaconda statement indicated that the company "has never received a complaint of failure of the product in service and has no knowledge of any such occurrence."

### Herron & Meyer Changes Name

William A. Herron, who has been associated with Herron & Meyer of Akron and New York City since 1934, has been admitted to the firm as a general partner and accordingly the name of the new partnership has been changed to Herron Bros. & Meyer. The new partner attended Lawrenceville Academy and was graduated from Princeton University with the class of 1908. Before joining Herron & Meyer, he was engaged in banking and for many years was connected with paper mill management. He lives in New Canaan, Conn. Mr. Herron works out of the New York office, as do Larry Walker, Ed Wright and H. A. Flint. Herron Bros. & Meyer recently opened a Washington office at 1010 Vermont Ave., N.W. Kenneth Springer, formerly of Wall Street, is manager.

### Form Plastic Industries, Inc.

H. W. Osborn, president of the Stalwart Rubber Co., and Clem Shaw, who is said to hold the basic patents on the injection molding of thermosetting materials, have formed Plastic Industries, Inc. The new company, which is housed in a portion of the Stalwart plant at Bedford, Ohio, will engage in the injection molding of thermosetting plastics.

### Washington Appointments

EVERETT G. HOLT, former Chief of the Rubber and Leather Division of the Bureau of Foreign & Domestic Commerce and more recently Chief of the Rubber Staff of that Bureau, has joined the Wild Rubber Division of the Rubber Reserve Co. as administrative assistant of the Information Section.

DR. CARL F. PRUTTON, head of the chemistry and chemical engineering department at the Case School of Applied Science, Cleveland, has joined the Office of the Rubber Director as a consultant on polymerization process work. He is also engaged on similar work for the Firestone Tire & Rubber Co.

P. W. BARKER, formerly connected with the Rubber & Leather Division of the Bureau of Foreign & Domestic Commerce, who has been associated with the War Department in recent months, has joined the Technical Department of the Wild Rubber Division of the Rubber Reserve Co. as rubber analyst.

JAMES R. TURNBULL, of Monson, Mass., has been appointed chief of the Thermoplastics Unit of the Plastics and Synthetic Rubber Section, Chemicals Division, WPB. He succeeds DR. RALPH H. BALL who has returned to the Celanese Corp., Newark, N. J., as assistant technical director.

DR. H. L. TURNBULL, manager of the chemical research division of the B. F. Goodrich Co., Akron, has been named a member of the special committee recently appointed by WPB to investigate cryptostegia as a source of rubber.

W. R. HUCKS, manager of the raw materials division of the B. F. Goodrich Co., Akron, has joined the operating division of the Rubber Reserve Co.

R. G. BOYD, manager of planning and scheduling in the tire division of the B. F. Goodrich Co., Akron, is now associated with the allocation division of WPB.

R. J. HULL, assistant manager of compounding of the tire division of the B. F. Goodrich Co., Akron, has joined the Office of the Rubber Director.

R. A. MAXWELL, a member of the war products department of the B. F. Goodrich Co., Akron, has become a member of the requirements and capacities section of the Office of the Rubber Director.

A substitute for rubber cement is said to have been developed by Oscar Kohorn & Co., Ltd., 501 Fifth Ave., New York City. The new substitute, for which commercial production is planned, is said to be superior to rubber and latex cements in many applications.

### Additional "E" Penants Awarded

A number of plants in the rubber and allied fields have been awarded the coveted Army-Navy "E" pennant in recent weeks. These included the following:

Barrett Division, Allied Chemical & Dye Corp., Frankford Plant, Philadelphia. Penna.

Whitney Blake Co., New Haven, Conn.

Bridgeport Fabrics, Inc., Bridgeport, Conn.

Continental Rubber Works, Erie, Penna.

Converse Rubber Co., Malden, Mass.

DeVilbiss Co., Toledo, Ohio.

Dow Chemical Co., Midland, Mich. (This plant was awarded two pennants for accomplishing "more than seemed reasonable or possible").

General Asbestos & Rubber Division of Raybestos-Manhattan, Inc., North Charleston, S. C.

Hercules Powder Co., Parlin Plant, Parlin, N. J.

Monsanto Chemical Co., St. Louis, Mo. (Monsanto has received 15 Army and Navy honors to date).

St. Marys Manufacturing Co., St. Marys, Ohio.

U. S. Rubber Co., Ordnance Plant, Des Moines, Iowa.

U. S. Rubber Co., Mishawaka, Indiana.

### Hold Hearings on Wage Increases

A panel of the War Labor Board at Washington began hearing wage increase cases affecting the rubber industry early this month. On the decisions which emerge eventually will depend whether rubber company employees receive increases in their current pay envelopes as well as hundreds of thousands of dollars in back pay. Cases to be heard include those affecting U. S. Rubber, Goodyear, Goodrich, Firestone and General Tire, although the order in which such cases will be heard has not been revealed. Members of the panel assigned to hear the rubber cases are Dr. E. Wight Bakke, of Yale University; D. R. Stewart, of the Oil Workers International Union; Walter White, of the Department of Commerce; and William H. Doran, of the Metropolitan Edison Co.

### Opens New York Office

Reichhold Chemicals, Inc., which recently announced the production of Agripol, a new synthetic rubber-like material produced from soy beans, has opened an office in New York City in the RCA Building, 30 Rockefeller Plaza. E. A. Terray, assistant treasurer of the company, will be manager of the new office, which will handle correspondence, records and all details involved in the regular routine of handling sales and purchases for the Eastern plant and territories. The export division, headed by F. A. Jolles, has also been moved to the new office.

# NEWS IN BRIEF

Why and how to conserve tires and other materials containing rubber is the theme of a new sound motion picture, "Drive for Victory," currently being distributed by the Goodyear Tire & Rubber Co., Akron. The film, endorsed by Rubber Director Jeffers, is tied in closely with all of the present wartime problems as they affect the average American home.

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The Barrett Division of the Allied Chemical and Dye Corp. has received an advertising citation from the U. S. Treasury Department "for distinguished services rendered in behalf of the National War Savings Program." The citation was awarded in recognition of the company's war bond advertising, particularly one which depicted the experiences of three men who had drifted for 34 days in the South Pacific on a rubber raft. The ad stressed the point that the lives of these men were saved by $300 worth of war bonds—the price of the rubber raft.

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Stair treads made of "Dura-Val," a new composition material that is said to look, feel and wear like rubber, have been introduced by the So-Lo Works, Loveland, Ohio. Treads come flat or with curved nosing in sizes 9x18 or 9x 24 inches. The product is reported to be unhampered by shortages or priorities and to be available for immediate delivery.

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A new six-page bulletin interpreting the recently amended WPB Conservation Order L-134, as it applies to the use of thermocouples and thermocouple protecting tubes for pyrometric instruments, has been issued by the Wheelco Instruments Co., Harrison and Peoria Streets, Chicago.

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The American Standards Association, 29 West 39th St., New York City, has announced the publication of its newest List of American Standards for 1942. More than 550 American standards are listed, of which 71 represent new and revised standards approved since the last issue of the list in February, 1942. Copies of the new list are free on request.

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In the interest of industrial conservation and to help speed war production, Metallizing Enginering Co., Inc., is offering a total of $650.00 in war bonds for details of maintenance and salvage procedures with the metal spraying process. Complete information and entry forms are obtainable from *Metco News*, 21-07 Forty-First Ave., Long Island City, N. Y.

In honor of the memory of the founder and first president of the Monsanto Chemical Co., the St. Louis, Mo., plant of the Organic Chemicals Division of the company will henceforth be known as the John F. Queeny plant. This plant, which recently received the Army-Navy "E", now makes over 100 chemical products.

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The development of storage batteries using a vitrified ceramic case composed of non-critical materials to replace rubber jars has been announced by the Storage Battery Division of the Philco Corp., Trenton, N. J. A special blend of four clays is used in the production of the new ceramic case. The ceramic material used is called "Vitrabloc" and is not penetrated or affected by acids. It does not absorb moisture.

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A new cotton yarn, called Ustex, which extensive tests have proved to be far stronger than any cotton yarn ever produced before, has been developed by U. S. Rubber, according to the company's textile division. The yarn, which does not require the long staple cotton which is now a critical military raw material, has been approved for use in parachute harnesses.

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In order to increase the telephone facilities of the Chicago offices and laboratories of Wishnick-Tumpeer, Inc., and the Pioneer Asphalt Co., in wartime, it has been necessary to change the telephone number. The new number, for both companies, is Whitehall 5900.

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Because scrap elastic material is generally used in their manufacture, restrictions on the production of brassieres and bandeaus were removed by WPB on December 15 by amending Order L-90. The order had originally limited monthly production of these items to 75% of the average monthly output in the three-month period ending March 31, 1941.

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Saf-T-Blak, a material to apply to windows to prevent light from being seen outside a building, and Saf-T-Glo, a luminous material that glows in the dark, two new patented process blackout aids, are currently being distributed by the General Tire & Rubber Co., Akron.

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A black waterproof mitten of gauntlet type, provided with a special trigger finger, is now being used by the Amphibian Command Engineers. Material for the mitten is latex-impregnated poplin. The palm is roughened to provide a non-skid gripping surface. The mitten was designed by the Quartermaster Corps.

## MONTREAL RUBBER GROUP HOLDS LOCAL TALENT NIGHT MEETING

The meeting of the Rubber and Plastics Division, Montreal Section, Society of Chemical Industry, held at the McGill Faculty Club in Montreal on January 8 was termed "Local Talent Night." It was designed to acquaint the rubber technologists with plastic molding and the plastic molders with the processing of rubber. It was generally agreed that the objective was accomplished.

The first speaker was John Beaudry of the Dominion Rubber Co., Ltd. He gave a complete outline of the handling of rubber from the Hevea tree to the finished product. He discussed compounding, molding, calendering, tubing, etc., and used numerous slides to illustrate the various types of machinery involved.

H. J. McCready, of Hale Bros., was the second speaker. He described all types of plastic molding at present in use for the thermoplastic and thermosetting resins and went into very concise detail with regard to the design and manufacture of molds. The discussion periods definitely indicated that technologists in both the rubber and plastics fields faced a number of similar problems.

The Division also held a meeting at the Ritz-Carlton Hotel in Montreal on December 16 at which H. I. Cramer, of Sharples Chemicals, Inc., who is also secretary of the Rubber Division, A.C.S., was the principal speaker. Dr. Cramer delivered his lecture on "Synthetic Rubber," bringing his listeners up-to-date on current developments. The meeting was held jointly with the parent society. Mr. Faust, president of the Canadian Chemical Association, was in Montreal for the occasion, and delivered a short address after dinner.

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### Reclaimers Elect Officers

The annual meeting of the Rubber Reclaimers Association, Inc., held in New York City on January 12 resulted in the election of the following officers: *President*, John P. Coe (Naugatuck Chemical); *Vice-President*, Jean J. Nesbit (U. S. Rubber Reclaiming); *Secretary-Treasurer*, Marion B. Miller. The following directors were named: Allyn I. Brandt (Philadelphia Rubber Works), V. H. Dingmon (Xylos Rubber), H. S. Royce (Boston Woven Hose), F. E. Traflet (Pequanoc Rubber), and William Welch (Midwest Rubber Reclaiming). Messrs. Brandt and Royce were also named chairmen, respectively, of the executive and membership committees. In addition, R. E. Casey and F. S. Conover, both of Naugatuck Chemical, were named chairmen, respectively, of the capacity and technical committees, and E. H. Brooks (Goodyear) was named chairman of the scrap committee. The Association maintains headquarters at 537 East 88th St., New York City.

# FINANCIAL NEWS

## FIRESTONE SALES RECORD REACHES NEW PEAK IN 1942

Net sales of the Firestone Tire & Rubber Co. reached an all-time peak in the fiscal year ended October 31, 1942. Sales amounted to $352,693,500, the largest in the company's history, representing an increase of 31% over the previous sales record of $268,091,826 in 1941.

Net profit for the year amounted to $12,481,129, after providing for all expenses including $10,307,082 for depreciation and $33,620,874 for taxes and after adding $3,000,000 to the reserve for contingencies. This is equal to $5.04 each on 1,930,811 shares of outstanding stock and compares with $11,262,427, or $4.37 each on 1,937,026 shares, reported for the previous fiscal year.

Total current assets as of October 31, 1942, amounted to $146,601,536, including $13,185,423 in cash, $47,690,453 in customers' accounts and notes receivable, less reserve, and $85,725,659 in inventories of finished goods and in-process products. Total current liabilities amounted to $54,408,642, including $2,865,530 in foreign bank loans, $18,470,735 in accounts payable, $18,463,877 in other payables, and $14,608,498 in accrued Federal, state and local taxes, less $10,000,000 tax anticipation notes. Total assets amounted to $263,673,194.

In a statement accompanying the report, John W. Thomas, board chairman, stated that although the company's normal export business has been limited by Government restrictions on the shipment of rubber products to foreign countries, a substantial volume of foreign business has been placed with the company through Lend-Lease channels. The plants in England, Canada, South Africa, India, Brazil and Argentina operated at capacity during the fiscal year. The company's total investment in foreign countries, after charging $1,072,828 to contingency reserve to cover the loss of investments in enemy-occupied territory, amounted to $31,901,215, of which $6,300,062 is invested in the British Isles. Net profits of foreign subsidiaries were $4,226,792 and are included in earnings. Dividends received from these subsidiaries amounted to $3,578,642.

## SEIBERLING RUBBER REPORTS NET INCOME OF $732,928

A net profit of $732,928 is reported by the Seiberling Rubber Company for the fiscal year ended October 31, 1942. This is equal to $2.12 a common share and compares with $813,918, or $2.40 a share, reported for the preceding fiscal year. Net sales amounted to $11,681,388 and $13,693,952, respectively.

Total current assets as of October 31, 1942, amounted to $4,632,092, including $934,800 in cash, $100,000 in savings bonds, $1,682,326 in notes and accounts receivable and other receivables, and $1,914,965 in inventories. Total current liabilities amounted to $768,877, including $380,593 in accounts payable, $160,666 in Federal taxes payable, $116,097 in other accounts payable, and $111,520 in accrued liabilities. Total assets amounted to $7,270,701.

A statement accompanying the report revealed that during the past year Seiberling sold for cash substantially all its unused real property and its stock interest in the Morgan Cotton Mills. It purchased, retired and cancelled 2,471 shares of $2.50 Prior Preference Stock, in addition to 10 shares of Class A preferred and 12 shares of Class B preferred.

The statement also indicated that the Seiberling Rubber Co. of Canada, Ltd., completed the finest year in its 15-year history with respect to both sales and profits, the company operating at near-capacity with approximately 80% of its production devoted to war purposes. The Avon India Rubber Co., Ltd., in England, the company's British affiliate, is also running at full capacity in the interest of the Allied war effort.

### Lee Rubber & Tire Corp.

Year Ended October 31: Net profit of $1,144,765, after taxes and provision of $150,000 for contingencies, equal to $4.74 each on 300,000 shares of $5-par capital stock, which compares with $1,482,954, or $6.14 a share, in the preceding fiscal year. Federal income tax and surtax for the year amounted to $703,893 and the excess profits tax to $327,166, after a post-war refund of $7,002. In the preceding year, Federal income and excess profits taxes were $515,554 and $13,045, respectively.

### Pharis Tire & Rubber Co.

Year Ended October 31: Net profit of $119,027, equal to 54c a share, which compares with $234,633, or $1.07 a share, in the preceding fiscal year. Net income for the six months ended April 30, 1942, amounted to only $2,340, because of interruptions in production, according to Carl Pharis, president, and the higher annual income is due to increased activity. Bank loans, which amounted to $300,000 at the beginning of the fiscal year, were paid off and net working capital totaled $1,373,756.

**BUY BONDS AND STAMPS**

### Additional Technical Bulletins

We are in receipt of three new technical bulletins from the British Rubber Producers' Research Association, 19 Fenchurch St., London, E.C. 3, England. These are: *Rubber, Polyisoprenes, and Allied Compounds. Part II. The Molecule-Linking Capacity of Free Radicals and Its Bearing on the Mechanism of Vulcanization and Photo-Gelling Reactions,* by E. H. Farmer and S. E. Michael; *The Interaction Between Rubber and Liquids. III. The Swelling of Vulcanized Rubber in Various Liquids,* by G. Gee; and *The Crystal Structure of β-Isoprene Sulphone,* by E. G. Cox and G. A. Jeffrey. The first of these is a reprint from the *Journal of the Chemical Society* and the latter two from *Transactions of the Faraday Society.* Copies can be secured without cost from the Association.

### Vinylite Resin VMCH

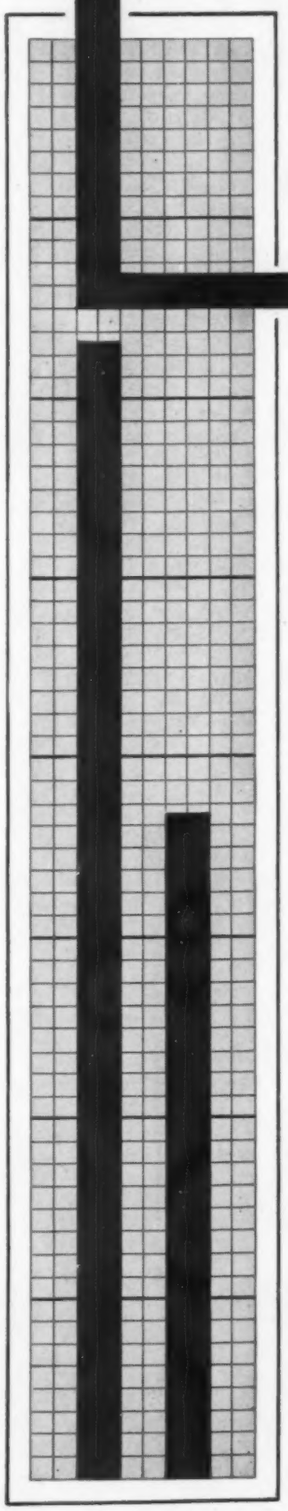
The Plastics Division of the Carbide & Carbon Chemicals Corp., New York City, recently announced a new and improved type of vinyl resin for corrosion-resistant maintenance finishes and other coating applications. The new resin, identified as Vinylite Resin VMCH, can replace rubber in certain coating applications. It is quite similar to the vinyl chloride-vinyl acetate resins in most of its properties and differs only in containing a small amount of an additional ingredient which improves its adhesive properties. It is completely compatible with the other grades and may be blended with them if desired. The solubility of VMCH is the same as the copolymer types.

### Dissolve Krebs Pigment Corp.

The Krebs Pigment and Color Corp., which has been a wholly-owned subsidiary of DuPont for the past eight years, has been dissolved. In the future, its functions will be carried on by the Pigments Department of E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware. The change in status involves no change in the personnel of the sales, manufacturing or research divisions, nor will there be any change in the management or policies. The new Pigments Department of DuPont will continue to supply white zinc sulfide and titanium pigments and chemical dry colors to industry.

### Norwalk Tire & Rubber Co.

Year Ended Sept. 30: Net profit of $142,350, after provision of $50,000 for post-war contingencies, equal to 55c a common share, which compares with $89,071, or 29c a common share in the previous fiscal year. Provision for Federal income and excess profits taxes amounted to $288,000, including $200,000 for excess profits taxes, less a post-war credit of $8,000. In the previous year, Federal income tax provision amounted to $36,000.



# EXTEND

## Vital Supplies of CRUDE and SYNTHETIC RUBBER, RECLAIMS and LATEX

*By Using*

# Vulprene Synthetics and Resin Emulsions

**Resin and Lacquer Emulsions have been finding an ever-widening use in many industries. They have proved invaluable in replacing other materials in adhesives, modifiers, binders and fillers, grease proofing, waterproofing, sizing, impregnating, coating, color dispersions and innumerable other uses.**

**In the Rubber Industry these emulsions are being used today as *Latex Modifiers* and *Complete Latex Replacements* to extend, thicken, stabilize, increase penetration, improve resistance to acids, oils and solvents; in *Coatings* to produce adherent pigmented or clear coatings on paper, fabric, and rubber and as intermediate coats for lacquer on rubberized cloth; in *Rubberizing* textiles; in *Latex Treated Papers* to increase strength and improve ageing; in *Adhesives*, for paper, for leather to cloth, and cloth to cloth.**

**These are just a few of the known applications in the rubber field. Undoubtedly in your own plant you will find many uses for these emulsions to improve your products and extend the supply of the vital materials, LATEX, RECLAIMS, and SYNTHETICS.**

Our Technical Staff Will Be Glad to Help You Solve Your Problems. . . . Write Today for Any Additional Information on our Products You may Require. . . .

***A Few of Our Products of Interest to the Rubber Industry***

**VULPRENE** A series of polymers designed to replace rubber for insulation, coatings, and moldings where the extreme flexibility, tensile strength, and abrasion resistance of rubber are not required. Available in a wide variety of modifications for individual requirements.

**ALKYD 18** An alkyd type resin emulsion which is non-yellowing and non-oxidizing. Film is water-white and non-tacky. Preferred where slight oxidizing action may be considered harmful to rubber. Extender for latex in coating, combining and impregnating processes.

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# LOS ANGELES NEWS

Work has been completed on the new plant of Plastic and Rubber Products at 2100 Hyde Park Boulevard. A frame and stucco building with an attractive exterior and interior now houses the various departments. There are two main production rooms, one 80 x 120 and the other 40 x 80 feet. Plastics constitute about 25% of the total volume of production at present.

What is reported to be the most complete rubber laboratory on the Pacific Coast is now being installed in the plant. A number of new machines have also been installed, including rubber mills and an automatic injector machine for plastics. A new high pressure boiler system and pressure pump have also been installed. A complete new dye shop is now part of the plastics department.

MacNeal Pierce, who was sales manager for the Kirkhill Rubber Co. and who is part owner of the company, is now giving his full time to the company's activities. N. O. Hulsey is also a part owner.

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LeRoy Ketler, who has been associated with the Typrene Roller Co. at 5811 Wilmington Boulevard, has joined the W. J. Voit Rubber Corp. Mr. Ketler, who held an interest in the Typrene concern, sold out to his partner, Charles Tyler, who has since leased the Typrene plant to the Kirkhill Rubber Co. James "Jim" Stull, well known in coast rubber circles, is now factory superintendent for Voit.

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The offices of the Sierra Rubber Co. are currently being enlarged and modernized, with about 33% additional floor space added. The vast amount of bookkeeping and clerical work occasioned by the war, plus the need for furnishing the many new Government reports, was in part responsible for the new space required. The plant is exceptionally busy and Bill and Claus VonderReith, the proprietors, are doing their best to maintain full and even production.

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Karl Faulhaber, head of the Faulhaber Rubber Co., reports that his plant is extremely busy pressing plywood for the war effort, principally for aircraft factories.

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L. D. "Mac" MacDonald, who served as treasurer of the Los Angeles Rubber Group last year and who was named vice-chairman this year, has resigned that position because of the fact that the vice-chairman automatically heads up the program committee and he has taken on so many duties with the shipbuilding firm where he is now employed that he feels he cannot handle all of the detail work involved.

Word from Joe Wehrle, formerly secretary to Frank Steele, general superintendent at Goodyear, indicates that he is now a private in the Army, stationed at the Presidio in San Francisco. He expects to be listed for secretarial work.

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Joel McIntire, who until 1934 was superintendent of Division A at the Goodyear plant, died recently. He was transferred to Akron late in 1934 but returned to Los Angeles about 18 months ago in poor health. He leaves a widow and daughter.

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An impressive ceremony was held at the Goodrich plant on Pearl Harbor Day. Army Captain Jack Hussey was the principal speaker. The Minute flag was raised during the ceremonies by E. S. Park, representing management, and James S. Martin, representing labor.

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Paul Shoaff, who was in charge of the Goodyear plantation in Java before the Jap invasion, will be superintendent of the new synthetic rubber plant being erected by the company in Los Angeles.

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William F. Wolfe, manager in charge of all factory production for Goodyear, was a visitor at the local plant last month.

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The new Year Book of the Los Angeles Rubber Group, which will be distributed at the February meeting of the group, to be held on February 2, is a considerable improvement over the initial book published last year. The color has been changed from buff to blue to designate the year of issue. This will be changed each year. The book features the inclusion of several pictorial reproductions, including pictures of the officers and of the outing held at the Uplifters' Club last summer. Some 250 members are listed.

## *Albert E. Starkie*

Albert E. Starkie, head of the distributing company in Chicago bearing his name, which sells wire finishes and saturants, synthetic pitch, special asphalts, asbestos fibres and other products to the rubber and other industries, died at his home, 5461 West Division Street, Chicago, on November 13, 1942, at the age of 48. He had been in poor health for some time but was active in the management of the company until his death. He leaves a widow, one daughter, and three sons, two of whom are in the Armed Services.

### Sounds Warning on Situation

The American chemical industry must solve the problem of synthetic rubber in seven months if we are to win the war, W. L. White, director of research and product design for the Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., told the members of the Export Managers Club in an address at the Hotel Pennsylvania in New York City on January 5. In order to solve this problem, he said, one which Germany has not been able to do in seven years, "there will have to be no more monkey-business on the part of Congress as to whether or not we are going to make it (synthetic rubber) of alcohol or petroleum."

Warning that at the present rate of consumption the nation's stockpile would be reduced by September, 1943, to the 120,000 ton minimum which the Baruch Committee stated was the nation's danger point, Mr. White stressed the fact that despite widely publicized reports of huge amounts of crude rubber to be obtained from South America, Africa, Ceylon and the United States itself, the total amount obtained from such sources would be less than 10% of our total needs. Mr. White is a member of several WPB advisory committees on rubber.

### Sues Ohio Rubber Company

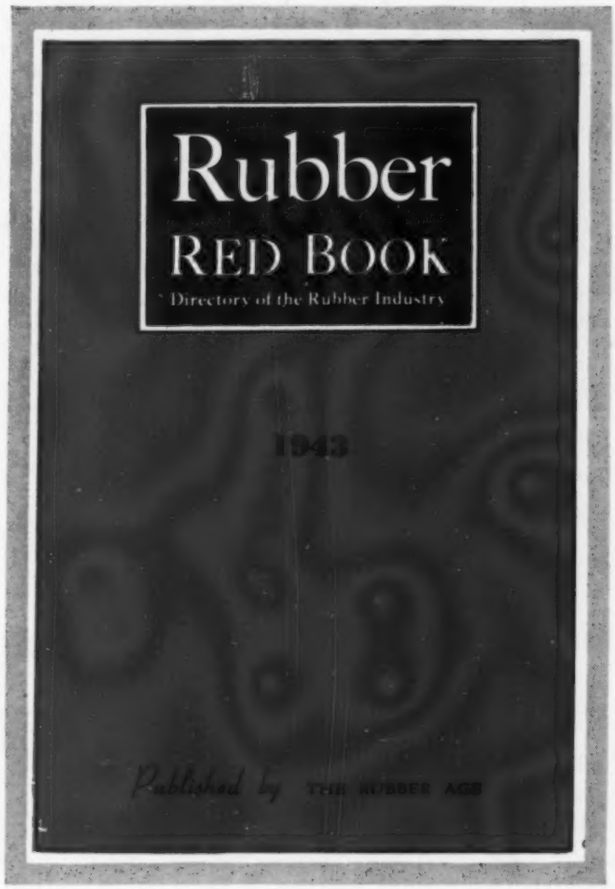
A suit asking for a mandatory injunction ordering payment to common stockholders was filed in Federal Court, Cleveland, on December 29, against the Ohio Rubber Co., Willoughby, Ohio. The suit was brought by Howard Bucher, III, of Rosemont, Penna., a director of the company, and requested that the court fix "fair and reasonable dividends." It also asked that the company be forced to issue a financial statement. Three directors of the company, including Franklin G. Smith, president, as well as the company itself, were named defendants in the action which charged, among other things, that Mr. Smith had been paid huge amounts in salary and bonuses for giving only part time to the firm. The setting aside of $800,000 for post-war contingencies was termed "unnecessary." The suit has been term "perfectly ridiculous" by one of the defendants.

### General Tire Acquires Network

General Tire & Rubber Co., Akron, has purchased the Yankee Network of 21 radio broadcasting stations covering the New England area. The sale was approved by the Federal Communications Commission on December 31. General Tire will pay $1,240,000 for the network plus an additional amount to be determined on the date of the transfer equal to 94% of the aggregate quick assets of the seller over $100,000. The purchase of the broadcasting unit, according to William O'Neil, president of the rubber company, was the first step in the company's post-war plans.

# *Have You Made Your Reservation Yet for Space in the*

# 1943 Rubber Red Book?

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**The Rubber Industry has expanded its line of products to meet war-time needs and is now making such items as aircraft and parts, shells, powder bags, anti-aircraft guns, metal gasoline tanks, oxygen cylinders, bullet links, ventilator parts, steel tank tracks, trench mortar bases, etc. This is a *premium market* for manufacturers of materials and equipment used in producing these war products—a market which can be covered thoroughly through the pages of the 1943 RUBBER RED BOOK.**

The next issue of the RUBBER RED BOOK—the only complete Directory of the Rubber Industry—will appear about May 15, 1943. It will reflect the many changes in personnel, products, materials, equipment, processes, etc., which have occurred in the past two years as a result of the war. Accordingly, an unusual amount of interest has already been expressed by the industry in the 1943 edition—the fourth to be published.

The RUBBER RED BOOK occupies an enviable position. It is an indispensable tool of purchasing agents in rubber factories and is constantly consulted by the research, sales and development departments of these factories. Suppliers, too, find it a valuable adjunct to their sales efforts because of the mass of data it contains on the industry. Among others who make constant use of it are the procurement divisions of the Army and Navy, the development and research laboratories of the government, and in fact every department in Washington concerned with rubber, where scores of copies are in daily use.

As a result, sellers of materials, supplies and equipment used by rubber manufacturers will, we believe, reach a more interested and responsive audience than ever before in the next edition of this directory. Advertisers will find this a most effective medium in which to call attention to their products or to keep their names prominently before their customers if they cannot fill orders for their regular products for the duration.

There will be no increase in advertising rates (send for latest rate card today). In view of the unusual importance of the 1943 issue we suggest you send in your reservation early, particularly if you are interested in any special positions.

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# CANADIAN NEWS

Establishment of the Rubber Control as a separate and distinct unit of the Wartime Industries Control Board has recently been announced at Ottawa. Previously, rubber was one of many materials under the jurisdiction of the Supplies Control but now it takes its place in a branch of its own along with the fifteen other units forming the W.I.C.B.

Rubber Controller is Mr. A. H. Williamson who, as Controller of Supplies, has had jurisdiction over rubber and rubber products since August, 1941. Deputy Rubber Controller is J. A. Martin, formerly a Deputy Controller of Supplies.

In addition to his duties as Rubber Controller, Mr. Williamson is Vice-Chairman of the Wartime Industries Control Board and only recently assumed the position of Timber Controller replacing A. S. Nicholson.

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The Rubber Substitutes Advisory Committee has recently been dissolved as it has served its purpose, which was to assist in the initial development of facilities for the production of synthetic rubber in Canada. For some time the work of the committee has been handled by the newer Synthetic Rubber Technical Advisory Committee.

Mr. J. R. Nicholson, general manager of the government-owned Polymer Corporation, Ltd., has retired from the chairmanship of the Synthetic Rubber Technical Advisory Committee but will remain a member of the group. His place as chairman has been taken by Dr. G. Stafford Whitby, for many years a member of the McGill University faculty and now associated with the University of Akron.

A new member of the committee is Mr. William B. Wiegand, of the Columbian Carbon Company, of New York. Mr. Wiegand, prominent in the rubber industry in the United States for many years, is a native Canadian who was born at Conestoga, Ontario, and had his start in rubber with the old Ames-Holden Tire Company at Kitchener. He replaces Dr. R. V. Yohe, of Akron, who has retired from the committee.

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In a recent address before the Automotive Transport Association of Ontario at Toronto, Mr. James Stewart, Administrator of Services for the Wartime Prices and Trade Board discussed the rubber situation at some length. Mr. Stewart said: "The rubber supply in this country is a matter of grave concern and the transportation industry has a duty, and a responsibility to see that no stone is left unturned to conserve their tires. To this end speeds should be curtailed, overloading absolutely prohibited, frequent inspections instituted, and in fact tires should be guarded even more carefully than the money you own, for they are more precious today than money."

Despite the number of trucks carrying war materials, Mr. Stewart indicated that only 60 per cent of its normal supply of rubber will be available to the transportation industry in 1943. The remaining truck operators will have to make their tires last for the duration.

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Charles S. Band, vice-president of Gutta Percha and Rubber, Ltd., Toronto, has recently been elected vice-president of Goderich Elevator and Transit Company at Goderich, Ontario. Mr. Band, who has been a director of the company for fifteen years, succeeds the late Charles R. Hunt.

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One of the pioneers of the Canadian rubber industry, Mr. John Jones McGill, died at his home in Montreal recently at the age of 82.

In 1886, when he was twenty-six years old, Mr. McGill joined the Canadian Rubber Company which later became Dominion Rubber. After some years with this organization he founded the Durham Rubber Company at Bowmanville and the Dominion Belting Company at Hamilton. In his later years he became president of the Dominion Oilcloth and Linoleum Company. He was also a vice-president and director of Canada Linseed Oil Mills, Ltd., a director of St. Lawrence Flour Mills Co., Ltd., and of Congoleum Canada, Ltd.

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On December 31, Goodyear Tire and Rubber Co. of Canada, Ltd., paid an extra dividend of $2.50 a share on its common stock along with the regular quarterly dividend of 63 cents a share. A similar extra dividend was paid in 1941.

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### Firestone Earthmover Tire

An earthmover and excavating tire, said to possess a new degree of durability and strength, and providing 98% more resistance to body breaks than tires heretofore available in this field of operation, has been announced by the Firestone Tire & Rubber Co., Akron. Called the Firestone Rayon Multi-Ply Tire, it was pointed out that it was developed for the three-fold purpose of increasing tire life, conserving rubber and speeding up earthmoving and excavating operations. Despite a number of new features incorporated to increase the strength of the tire body, the new tire maintains a full degree of flexibility, a characteristic essential to efficient operation.

### Show New Film on Die Casting

A new and highly educational film on "Die Casting," tailored to fit the intellectual level of the average engineering student, was shown to a group of technical and business paper editors by the New Jersey Zinc Co. at the Preview Theatre in New York City on December 18. The picture is the focal point of an educational program worked out by the company to explain the production and advantages of die castings to students and engineers. Although made by the New Jersey Zinc Co., no attempt is made in the film to give the impression that the die casting process is restricted to the use of zinc alloys, metals competitive to zinc, including aluminum and magnesium, receiving more than passing mention. R. Davison, manager of the Market Development Division of the N. J. Zinc Co., introduced the film, while C. R. Maxon, of the same department, explained the reason for the film at the conclusion of its presentation. A book on "Die Casting for Engineers," also prepared by the company, which is reviewed elsewhere in this issue, was presented to those attending the preview.

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### Urge Ratings on Color Orders

Because practically all colors are readily available at present, many buyers have ceased to use preference ratings even for essential war orders and this, together with the elimination of the end use symbols covered by Priorities Regulation No. 10, leaves the color manufacturer with little or no data to establish the essentiality of the colors being purchased. Many of the vital materials used in the production of colors, however, may well be placed under some form of restrictive order by WPB during the current year, and therefore the Chemical and Organic Pigment Industrial Advisory Committee of WPB urges consumers to continue to supply end use information or preference ratings on all color orders placed so that the manufacturer may be in a position to prove the essentiality of the colors consumed if necessary. The same situation applies to orders for white pigments.

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### Elected Firestone Secretary

B. M. Robinson was elected secretary of the Firestone Tire & Rubber Co., at a meeting of the directors of that company held in Akron on January 9. He succeeds Stacy G. Carkhuff who remains as a director of the company. All other officers and directors were re-elected. Mr. Robinson has been general counsel and assistant secretary. He joined Firestone 24 years ago and organized the legal department which he has directed ever since. He received degree in liberal arts at the University of Indiana and came to the company after nine years of practice. He is active in both community and civic affairs in Akron.

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# OBITUARIES

## *Frederic C. Hood*

Frederic Clark Hood, founder of the Hood Rubber Co., Cambridge, Mass., and president and director of that company until his retirement in 1929, died at his home in Boston's Back Bay on December 24 at the age of 77. Prior to his retirement he was active in practically all branches of the rubber industry.

Born in Chelsea, Mass., in 1865, Mr. Hood attended Harvard College, being graduated in 1886. Immediately after his graduation he joined the Boston Rubber Company, advancing to the position of superintendent and later assistant treasurer of the company. In 1896 he organized the Hood Rubber Co. at Cambridge, serving as treasurer and general manager from 1896 to 1923 and president from 1923 to 1929. He retired in the latter year when the company was acquired by the B. F. Goodrich Co.

Mr. Hood served as president of the Rubber Association of America, predecessor of the present Rubber Manufacturers Association, from 1911 to 1913. He also served as president of the Associated Industries of Massachusetts in 1917-18, was associated with ex-President Taft on the National War Labor Board in 1918, and was treasurer of the National Industrial Conference Board in 1917-18.

For more than 20 years Mr. Hood was a member of the executive committee of the Brookline (Mass.) Country Club. He was also a member of the Kittansett Club, whose golf course he was instrumental in designing, and of the Sons of the American Revolution. He also acted as chairman of the Harvard Class of 1886 for more than 20 years. In addition to being an ardent golfer, Mr. Hood was also a leading breeder of prize Airedale dogs. He leaves a widow and one son.

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## *Edgar Palmer*

Edgar Palmer, chairman of the board and former president of the New Jersey Zinc Co., died at his home in Princeton, N. J., on January 8 at the age of 62 after an illness of one week. He was a charter trustee of Princeton University and was widely known as a benefactor of both Princeton and the Stevens Institute of Technology. His gifts to Princeton included the Palmer Memorial Stadium, built in memory of his father, Stephen S. Palmer, also a trustee of the university.

Mr. Palmer was born in New York City in 1880. He prepared at the Taft School in Watertown, Conn., and received his B.S. degree from Princeton in 1903 and an electrical engineering degree in 1905. Before joining N. J. Zinc in 1909, he worked with the Westinghouse Electric & Manufacturing Co. and the Empire Zinc Co.

Starting with N. J. Zinc as assistant to the general manager, Mr. Palmer was made assistant to the president within six months and the following year served for a time as acting president. After serving as a vice-president until 1912, he was named president and held that position for 15 years before resigning to become chairman of the board.

In addition to his connection with N. J. Zinc, Mr. Palmer was chairman of the boards of several other companies, some of them connected with the zinc company, and acted as trustee for the Central Hanover Bank and Trust Co. of New York City and the Consolidated Edison Co. He was also engaged in the real estate business. Funeral services were held in the Princeton University Chapel on January 10 with interment in Princeton Cemetery. A widow and daughter survive.

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## *Frederick D. Chester*

Dr. Frederick Dixon Chester, chief chemist of the Mimex Co., Inc., rubber manufacturers of Long Island City, N. Y., died in his home, 2965 Marion Avenue, New York City, on January 2, at the age of 81, after a short illness. He was an authority on determinative bacteriology and was the author of the first textbook on this subject published in this country. He was also known for his researches in microbiology and biochemistry.

Born in Santo Domingo, Haiti, in 1861, Dr. Chester studied at Washington University in St. Louis from 1876 to 1878 and obtained a B.S. degree in 1882 and an M.S. degree in 1885 from Cornell University. During his lifetime he was Professor of Geology and Botany at Delaware College, bacteriologist and mycologist at the Delaware Experimental Station, director of the Delaware State Bacteriological Laboratory, chief chemist of the Stackpole Co., and director of research of the Technical Sales Corp.

While acting as chief chemist for the Mimex Co. during the past few years, Dr. Chester was also engaged on special research on fungi at the New York Botanical Garden, holding a fellowship there the last two years. In 1940 he acted as chief bacteriologist on a survey for New York City on the bacteriological decomposition of land fills. A widow survives.

## *George A. Williams*

George Alvin Williams, first vice-president in charge of sales and one of the organizers of the United Carbon Co., died in his home at the Charleston, West Virginia, Country Club on January 4. He was 52 years of age and had been in poor health for the past six years.

Born in Weston, West Virginia, in 1890, Mr. Williams attended the public schools in Clarksburg and the Episcopal High School in Alexander, Va. In 1909 he completed a course at the Eastman Business College in Poughkeepsie, N. Y., and from the end of that year until 1915 he traveled for the Yale & Towne Manufacturing Co. of Stamford, Conn., mostly in Canada. He returned to Clarksburg late in 1915 to become manager of the Fuel City Manufacturing Co.

In 1925 Mr. Williams and a group of associates, including Oscar Nelson, now president of the company, organized the United Carbon Co. The company was formed as the result of a merger of several carbon black companies, including the Liberty Carbon Co., Louisiana Carbon Co., and the Kidas Carbon Co.

Mr. Williams was a member of Christ Episcopal Church. He was a Mason and a past exalted ruler of B.P.O. Elks No. 482. A widow, one son and two daughters survive.

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## *Andrew J. Fleiter*

Andrew J. Fleiter, president of the Akron Standard Mold Co. and a pioneer in the manufacture of rubber molds and machinery, died at his home, 1415 West Exchange St., Akron, Ohio, on December 29. He was 60 years of age and had not been a well man for many years.

A resident of Akron for the past 51 years, Mr. Fleiter was known as one of that city's first pro football players, having played with the old Akron Imperials. He never quite lost his enthusiasm for football and was an ardent admirer and supporter of that game.

Associated with the machinery business practically all of his life, Mr. Fleiter organized the Akron Standard Mold Co. in 1918, serving as president, treasurer and general manager. At the time of his death he was also president and treasurer of the Electromelt Steel Casting Co., which he organized in 1938, and vice-president and general manager of the Barberton Foundry Co.

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## *Benno T. Schall*

Benno T. Schall, secretary-treasurer of the Corduroy Rubber Co., Grand Rapids, Mich., died in his sleep on December 6 from a heart attack. He was 61 years of age. Mr. Schall was a native of St. Joseph, Mich., and was associated with the hardware field for many years. He joined Corduroy Rubber in 1924 and four years later was named secretary-treasurer, holding that position until his death.

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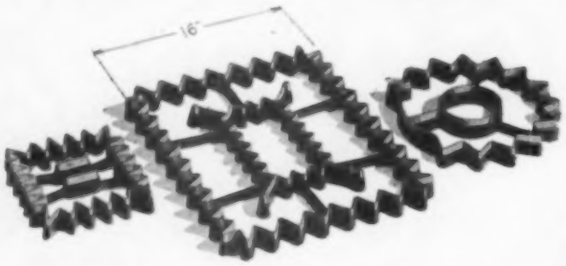


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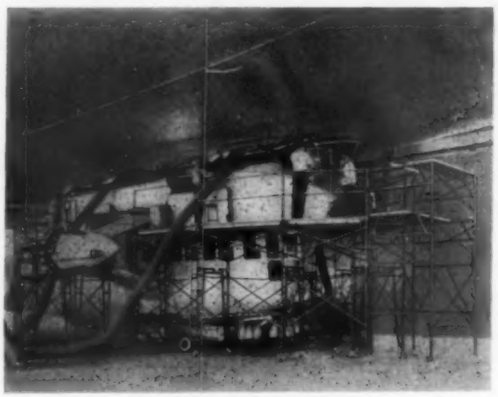
# NEW EQUIPMENT

## Time-Saving Assembly Method

A new time-saving assembly method for attaching the gondola to the bag of blimps has been designed by Safway Steel Products, Inc., Milwaukee, Wisconsin, in conjunction with engineers of the Goodyear Tire & Rubber Co. As shown in the accompanying illustration, Safway scaffolding completely encircles the gondola, fits easily around corners or projections, and provides ample working space for operators.



*Safway scaffolding encircling a gondola*

Goodyear engineers state that the new method is saving many valuable hours of assembly time compared with the "horse-and-plank" method formerly used. When a gondola is received, the scaffolding is rolled into the required position and locked in place by means of brakes on the casters. Assembly can begin at once. When work is completed, the scaffolding is rolled away until another gondola is ready for assembly.

Safway is a scientifically designed system of steel scaffolding. The basic unit consists of two end frames which, when erected, are held rigidly together by two cross braces. This forms a complete unit 5 feet wide, 7 feet long and 5 feet high. Desired heights are obtained by adding similar units to the basic unit through the use of coupling pins. Additional lengths are made by adding frames and fastening them together with cross braces.

Features of Safway scaffolding stressed by the manufacture include the following: It is light in weight, extremely rigid and extra strong. It occupies minimum space both when erected or dismantled and stored. All parts are interchangeable and may be used over and over again in a numberless variety of forms and shapes. Safway is simple, dependable, foolproof and fireproof, and is fully approved by Underwriters Laboratories.

To meet a wide variety of demands, the Safway line includes ladders, hoists, ramps, steel rolling towers, materials handling towers. On request, the company will furnish suggestions on special forms, based on the single Safway unit, to serve individual plant requirements.

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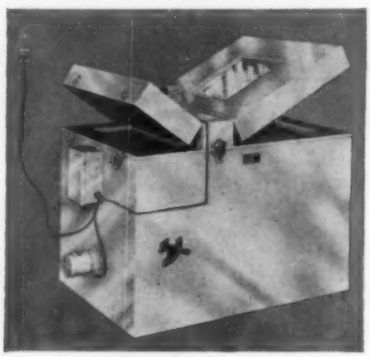
## Constant Temperature Dry-Ice Cabinet

A new development for use wherever reliable, convenient, trouble-free and speedy refrigeration is required in the laboratory, is offered by the American Instrument Co., Silver Spring, Maryland. It is said to provide temperatures from —90° F. up to 220° F., with a constancy of plus or minus ½° F. The new unit is intended for use where expensive mechanical refrigeration would not be justified. It is available in two temperature ranges: from zero to minus 90° F., and from 220° F. to minus 90° F. Temperatures of



minus 65° F. and 90° F. are attained in 15 and 30 minutes respectively from an initial temperature of 85° F. Temperatures can be held at minus 40° F. and minus 90° F. in an ambient temperature of 85° F. for 24 hours with 40 and 60 lb. of dry ice respectively.

The cabinet is portable and ready for operation after packing with dry ice and plugging the cord into the current supply. Once packed with dry ice it requires no further attention until a new charge of dry ice is required. The temperature within the cabinet is held constant within plus or minus ½° F. In the low-temperature model, this close temperature control is made possible by means of an Aminco Quickset Bimetal Thermo-regulator, which, through a solenoid and an electronic relay (time-delay), operates a damper that allows air to be passed over the dry ice when cooling is needed, or to be by-passed when cooling is not needed. The temperature control system requires only natural heat leakage for its operation. No electric heaters are used in this model to control the temperature, thus effecting appreciable savings in dry ice consumption. In the high-and-low-temperature model, the control described above is augmented by the installation of Aminco LoLag Electric Heaters.

The working chamber (24x24x24 in.) has a hinged removable cover in which is incorporated a 5-ply vacuum-sealed plate glass window. Another hinged cover is provided for access to the dry-ice compartment. The dry-ice compartment (75 lb. capacity) is heavily insulated from the working chamber and the by-pass duct, thus conserving the supply of dry ice when refrigeration is not required. Air is circulated constantly through the cabinet by means of a fan located beneath the dry-ice compartment, the fan being driven by a motor mounted outside the cabinet. The dry-ice compartment is provided with an externally-controlled hand damper, which limits the amount of air passed over the dry ice in proportion to the temperature desired. A scale permits quick setting of the damper.

# REVIEWS

## BOOKS

**Machine Shop Work.** By John T. Shuman. Published by the American Technical Society, 58th St. at Drexel Ave., Chicago, Ill. 5½ x 8¼ in. 499 pp. 572 ill. $3.50.

This book, one of the "how-to-do-it" series issued by the publishers, of special importance today because of the war effort, has been written on the basis that consistent progress in machine shop work cannot be made unless the student or worker understands the principles underlying the use of various tools and machines common to a modern shop, including machine shops operated by large industrial organizations. Accordingly, emphasis is placed on the fundamentals behind the tools of the trade, with special attention given to the operation of the standard machine tools.

Several helpful features are incorporated in the book, including a "trouble-shooting" page at the end of each of the chapters on machine tool operation, in which the operating difficulties encountered on each particular machine are tabulated and each difficulty is followed by its probable cause and its suggested remedy, and quiz questions presented at the end of each chapter or section. The book, therefore, is particularly valuable today when machine shop operators are faced with the problem of training their own help, since skilled workers are becoming rare and hard to find.

The book has 15 chapters, a section devoted to tables, and a carefully-compiled index which is satisfactorily cross-indexed. The author, incidentally, is Coordinator of the Williamsport Technical Institute and compiled the book in collaboration with three additional well-qualified instructors of machine shop practice.

•

**Chemical Technical Dictionary (German-English-French-Russian).** By A. W. Mayer. Published by Chemical Publishing Co., Inc., 234 King St., Brooklyn, N. Y. 5½ x 8½ in. 872 pp. $8.00.

This dictionary, one of the most comprehensive grouping English, German, French and Russian, insofar as technical dictionaries are concerned, will prove very useful for those who wish to study the German, French and Russian technical literature. As many a research worker has discovered, ordinary dictionaries very often fall short of satisfactory translations and definitions where technical terms are concerned. This is especially true of the Russian literature, and accordingly technical dictionaries of this type are extremely helpful. The dictionary is also recommended to translators of the four languages and to college students. The translation of the dictionary was under the direction of Prof. B. N. Menshutkin and Prof. M. A. Bloch.

•

**Die Casting for Engineers.** Prepared and published by the New Jersey Zinc Co., 160 Front St., New York, N. Y. 6 x 9 in. 148 pp. $1.00.

Although the process of die casting during the past few years has come to be recognized as one of the leaders among modern high speed production methods in the metal working industry, it has not yet reached its full development. This book has been prepared with the purpose of being of assistance to students as well as to engineers in industry who wish to become more familiar with that development. Every effort was made to present an impartial analysis of all of the many alloys in use, so that the engineer may make intelligent utilization of the inherent advantages of the process itself. The book is liberally illustrated and has a complete subject index.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LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
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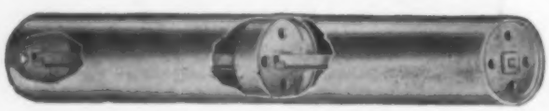
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## REVIEWS (CONT'D)

**Plastics Catalog: 1943.** Published by Plastics Catalogue Corp., 122 East 42nd St., New York, N. Y. 9 x 12 in. 864 pp. $5.00.

The latest edition of this catalog, the largest published to date, highlights further annual expansion of the rapidly growing plastics field. A special section, "Plastics in War," which details plastics in every arm, branch and bureau of the Government having any relationship with the plastics industry, and which lists Government offices maintaining procurement contacts with plastics manufacturers, is a feature of the current edition. The subject of synthetic rubbers has been expanded, with several articles added. These articles, briefly outlining the properties and uses of the various synthetic rubbers and rubber-like materials, cover neoprene, Koroseal, Thiokol, Resistoflex, Ameripol, Hycar, Chemigum, Buna S, Perbunan, Vistanex and Butyl Rubber. A chart giving the known physical, chemical and electrical properties of these materials is also included. A section on Chlorinated Rubber Coatings is again given. There are ten sections in all, plus comprehensive indexes and directories.

## BOOKLETS, CATALOGS, Etc.

**Compounding of Buna S.** (Report No. 42-4). By H. L. Lawrence. Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware. 6¼ x 9½ in. 48 pp.

This report on Buna S compounding deals primarily with acceleration. Sulfur and accelerator ratios for all of the important well-known types of organic accelerators are discussed. The information and data presented are based on tests conducted over a period of several months and inasmuch as several different production lots of Buna S were used during this period, comparative data presented in different tables do not check as closely as similar data would be expected to check if they were obtained from rubber compositions. Additional work conducted by DuPont since the preparation of this report is said to confirm earlier findings that the two best types of acceleration in Buna S are Thionex 0.25 to 0.5 parts with 2 to 4 parts of sulfur per 100 parts of Buna S, and 2-MT 0.85 to 1.25 parts with Accelerator 808 0.15 to 0.25 parts in conjunction with 2 to 3 parts of sulfur per 100 parts of Buna S.

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**Preliminary Evaluation of Columbia Pigments in Synthetic Rubbers.** Columbia Chemical Division, Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh, Penna. 8½ x 11 in. 32 pp.

The results of a series of compounding tests on Columbia pigments in representative synthetic rubbers are contained in this technical report. Although the series is by no means complete, it is hoped the information tabulated may be of assistance to compounders. The purpose of the work has not been to develop stocks for specific uses but to obtain basic data on the behavior of Columbia pigments, particularly Silene, in comparison with some of the other pigments which will undoubtedly be used. Six synthetic rubbers are covered in the present report, including Buna S, Perbunan, Hycar OR, Neoprene GN, Butyl B, and Thiokol RD.

•

**War Production in 1942.** Division of Information, War Production Board, Washington, D. C. 8½ x 11 in. 22 pp.

As indicated by the title, this informative booklet traces American war production during the year of 1942. The problems of materials, rubber, conservation, priorities and allocations, conversion of industry, small manufacturers, etc., are discussed and steps taken to meet them outlined. A section of the booklet is devoted to organizational developments.

**Storage and Handling of Butadiene, Isobutylene, Styrene, and Acrylonitrile.** By James B. Garner, Ludwig Adams and Robert M. Stuchell. Mellon Institute of Industrial Research, Pittsburgh, Penna. 9 x 12 in. 12 pp.

Reprinted from the October, 1942, issue of *Petroleum Refiner,* this pamphlet represents the results of a comprehensive study of the storage and handling of butadiene, isobutylene, styrene and acrylonitrile, the four most common chemical substances used in relatively large quantities in the production of synthetic rubber. The study consisted of a search of the available literature, the compilation of data from several cooperating organizations to establish the physical and chemical characteristics of the four substances, and experimental work to determine the corrosive effect of the stored substances upon steel containers and also the effect of the steel containers on the stored substances. The study was made by the Chemical Storage Fellowship maintained at Mellon Institute by the Pittsburgh-Des Moines Steel Co.

•

**Some Physical Properties of Butadiene and Styrene.** (Letter Circular LC-710). By Lawrence A. Wood and Catherine F. Higgins. National Bureau of Standards, Washington, D. C. 8 x 10½ in. 8 pp.

Based on both a search of the literature and the measurement of certain properties at the National Bureau of Standards, the values of butadiene and styrene, the materials copolymerized to make Buna S, which are regarded by the Bureau as most reliable at the present time, have been collected and put into tabular form in this letter circular. They are currently presented to meet an immediate demand for such data, but the point is stressed that in most cases the data has not been checked by independent observations. Revisions will be made as further information becomes available.

•

**Ambidex in Type F Tires.** Binney & Smith Co., 41 East 42nd St., New York, N. Y. 8½ x 11 in. Looseleaf. 3 pp.

The results of modulus, tensile, elongation and Durometer tests on formulas using respectively 0.8 parts of Ambidex and 40 parts of Standard Micronex and Micronex W-6, respectively, are given in this bulletin. In the formulas used, Ambidex has been employed primarily as an activator, supplementing an accelerator of the conventional type, but it is pointed out that Ambidex has much broader possibilities. The results indicate that increased amounts of Ambidex permit higher black loadings along with reduction of other accelerator. The WPB specification for Type F tires requires that no crude rubber shall be used in the tread and limits the maximum percentage of reclaim to 89.3% by volume.

•

**Bakelite Laminating Plastics.** Bakelite Corp., 30 East 42nd St., New York, N. Y. 8½ x 11 in. 24 pp.

Bakelite laminating plastics are actually varnishes manufactured by the Bakelite Corp. and sold to manufacturers who produce finished laminated plastic products. This booklet describes the company's laminating varnishes and discusses the various types of laminated plastics, including sheet stock, tubing, rods, rubber-laminated plastics, decorative sheet stock, and translucent sheet stock. A table showing the properties of laminated phenolic plastics is included.

•

Five new bulletins describing its complete line of *industrial indicating, recording and control thermometers* have been issued by the Wheelco Instruments Co., Harrison and Peoria Streets, Chicago. Bulletin G23-2 discusses the operating principle of Wheelco thermometers; G503-2 covers recording control thermometers; G603-2 is on indicating control thermometers; G303-2 describes and gives applications for indicating thermometers; and G403-2 covers recording thermometers.


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# MARKETS

***Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings***

**NEW YORK, JAN. 14, 1943**

## Crude Rubber

THE recently-proposed Brazilian plan to send 50,000 tappers into the Amazon jungles, thus assuring the United States of approximately 35,000 to 40,000 tons of crude rubber during the current year, moved closer to reality this past month when it was announced that a special agreement had been signed between the two countries. The agreement makes provision for transporting the workers by any routes available—land, sea, air, afoot, etc. As previously revealed, stations will be constructed along the route of travel to guarantee proper food, clothing, medical attention, and all of the other necessities required.

Just as this issue went to press, it was reported from Rio de Janeiro that 400 seringueiros, the Brazilian term for tappers, had already started the long trek to the rubber areas. These workers are really trail blazers, since they will report all hazards encountered to the government, so that the latter may be guided accordingly where further travelers are concerned. In all, it was reported, some 1,300 workers were already headed for the jungles.

Additional encouraging reports have been received from both Peru and Ecuador. New trails are being opened, new highways laid, and paper plans are turning into realities. Nicaragua, too, is expected to produce almost twice the amount originally believed possible, and while dwarfed by the rubber possibilities of its big neighbor, Brazil, the country seems to be well on the way to making rubber one of its prime exports.

An interesting report has recently come from London where large rubber interests were attempting to have the British Government commit itself on losses sustained in the Far East as a result of the Japanese invasion and the scorched earth policy. The Government has refused to enter into any such commitments, one official stating that it would be unreasonable to expect the Government to do more than promise that it will give what assistance it can in the future.

Prices shown below are those set by Rubber Reserve:

As of January 14

*Fixed Government Prices*

| | | | |
|---|---|---|---|
| ***Plantations—*** | | | |
| Ribbed Smoked Sheets— | | | |
| No. 1 Spot | — | @ | .22½ |
| No. 2 | — | @ | .22¼ |
| No. 3 | — | @ | .22 |
| No. 4 | — | @ | .21¾ |
| Thin Latex Crepe | — | @ | .23⅛ |
| Thick Latex Crepe | — | @ | .23⅛ |
| Brown Crepe, No. 1 | — | @ | .21¾ |
| Brown Crepe No. 2 | — | @ | .21⅛ |
| Amber Crepe, No. 2 | — | @ | .21¾ |
| Amber Crepe, No. 3 | — | @ | .21⅛ |
| Brown Crepe, Rolled | — | @ | .17⅛ |
| ***Latex—*** | | | |
| Normal, carload lots, tanks | — | @ | .2595 |
| Normal, carload lots, drums | — | @ | .2825 |
| Conc., carload lots, tanks | — | @ | .2765 |
| Conc., carload lots, drums | — | @ | .2950 |
| ***Guayule—*** | | | |
| Ampar | — | @ | .28 |
| ***Paras—*** | | | |
| Up-River, fine | — | @ | — |
| Acre Bolivian, fine | — | @ | — |
| ***Balata—*** | | | |
| Surinam Sheet | — | @ | .81 |
| Prime Manaos Block | — | @ | .71 |
| Peruvian Prime | — | @ | .70 |
| Venezuelan Block | — | @ | .73 |

## Scrap Rubber

Dealers report that some of the unfit tires collected in the Idle Tire Return Plan are finding their way into regular scrap rubber channels, with the result that collections have stepped up somewhat in recent weeks. Rubber Reserve agents expect a good deal of this rubber to enter into trade channels, in view of the fact that about 40% of the 10,000,000-odd tires collected have been declared unfit for retreading or recapping. Prices shown below are those currently in use, although they do not correspond to the ceilings set in a recent amendment to Revised Price Schedule No. 87:

(Prices to Consumers, Delivered Akron)

| | | |
|---|---|---|
| Mixed passenger tires | ton | $18.00 |
| Beadless passenger tires | ton | 24.00 |
| Mixed truck tires | ton | 18.00 |
| Beadless truck tires | ton | 24.00 |
| No. 1 passenger peelings | ton | 47.50 |
| No. 1 truck peelings | ton | 47.50 |
| Gray carcass | ton | 47.50 |
| No. 2 passenger tubes | lb. | .07¾ |
| Red passenger tubes | lb. | .07½ |
| Black passenger tubes | lb. | .06¾ |
| Mixed passenger tubes | lb. | .06¾ |
| No. 2 truck tubes | lb. | .07½ |
| Red truck tubes | lb. | .07¼ |
| Black truck tubes | lb. | .05¼ |
| Buffings | ton | 35.00 |
| Bicycle tires | ton | 15.00 |
| Air bags and water bags | ton | 15.00 |
| Boots and shoes | ton | 33.00 |
| Black mechanical scrap, above 1.10 | ton | 20.00 |

## Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15, 1942.

(Prices Net at the Mill)

| | | | |
|---|---|---|---|
| Peeler, carded, 23/5/3 | lb. | .43½ @ | .44 |
| Peeler, carded, 23/4/3 | lb. | .44½ @ | .45 |
| Peeler, carded, 15/3/3 | lb. | .41½ @ | .42 |
| Peeler, carded, 15/4/2 | lb. | .41½ @ | .42 |
| Peeler, carded, 13/3/3 | lb. | .40½ @ | .41 |
| CHAFERS | | | |
| Carded, American, 1 1/16" | lb. | .43½ @ | .44 |
| Carded, America, 1" | lb. | .39½ @ | .48 |

## Sheetings

| | | | | | |
|---|---|---|---|---|---|
| 48x40 | 36 in. | 5.50 | lb. | — | @ 7.818 |
| 40x40 | 36 in. | 6.15 | lb. | — | @ 6.991 |
| 40x36 | 36 in. | 6.50 | lb. | — | @ 6.615 |
| 48x48 | 40 in. | 2.50 | lb. | — | @16.200 |
| 48x48 | 40 in. | 2.85 | lb. | — | @14.210 |
| 56x60 | 40 in. | 3.60 | lb. | — | @11.944 |
| 48x44 | 40 in. | 3.75 | lb. | — | @11.066 |

Note: Prices shown above are ceiling prices set by order of the O.P.A. Quotations are based on an average price of 15-16-inch middling cotton of 20.37c at the ten designated southern markets.

## Cotton

The price of middling uplands on the Cotton Exchange has swung in a 91 point range since our last report, topping 21c on January 2, high for the period being 21.40 on January 11 and low 20.49 on December 15. Although an occasional nervous tone was evident in the market, prices moved upward slowly but steadily, considerably aided by the growing belief that the new Congress would clarify recent Washington developments, particularly with regard to steps to ward off further inflation. The greatest jump recorded during the period occurred on January 7 when the price went from 21.07 to 21.30, the jump being due to President Roosevelt's address to a joint session of the Seventy-Eighth Congress. The President's message was taken as indicative of a good year for cotton demands. His budget message, delivered a few days later, also served to strengthen the market. Cotton consumption during December amounted to 935,511 bales, against 913,308 bales for November and 888,379 bales in December, 1941. Quotations for middling uplands on the Exchange follow:

| | Dec. 12 | January 14 | | |
|---|---|---|---|---|
| | Close | High | Low | Close |
| March | 18.78 | 19.65 | 19.43 | 19.60 |
| July | 18.50 | 19.43 | 19.20 | 19.39 |
| October | .... | 19.36 | 19.15 | 19.30 |

## Reclaimed Rubber

Both production of and demand for reclaimed rubber is continuing at fairly high levels. Approval given to the production of the so-called all-reclaim tires in the program laid down by Rubber Director Jeffers to meet all "essential" requirements is in part responsible for the current trend. Sales of synthetic rubber reclaim, as yet but minor in volume, have been price exempted to encourage development. Prices shown below are ceilings on typical grades of reclaim:

| | | | | |
|---|---|---|---|---|
| ***Shoe*** | | | | |
| Unwashed | lb. | .07 | @ | .07¼ |
| ***Tube*** | | | | |
| Black Tube | lb. | .11¼ | @ | .11½ |
| Red Tube | lb. | .12 | @ | .12¼ |
| ***Tires*** | | | | |
| Black (acid process) | lb. | .07½ | @ | .07¾ |
| Black, selected tires | lb. | .06½ | @ | .06¾ |
| Truck, Heavy Gravity | lb. | .08½ | @ | .08¾ |
| ***Miscellaneous*** | | | | |
| Mechanical blends | lb. | .04½ | @ | .05½ |
| White | lb. | .13 | @ | .13¼ |

## Ducks

| | | | |
|---|---|---|---|
| Enameling (single filling) | lb. | — @ | .44¼ |
| Belting and Hose | lb. | — @ | .39 |
| Single filling, A grade | lb. | — @ | .19¾ |
| Double filling, A grade | lb. | — @ | .20¾ |

# CHEMICAL MARKETS

*New York, Jan. 14, 1943*
*All Prices F.O.B. Works*

### ACCELERATORS

Organic

| | | | |
|---|---|---|---|
| A-1 (Thiocarbanilid) | lb. | .28 @ | .33 |
| A-10 | lb. | .36 @ | .42 |
| A-11 | lb. | .52 @ | .65 |
| A-19 | lb. | .52 @ | .65 |
| A-32 | lb. | .60 @ | .70 |
| A-77 | lb. | .42 @ | .55 |
| A-100 | lb. | .42 @ | .55 |
| Aldehyde ammonia, crystals | lb. | .65 @ | .70 |
| Altax | lb. | .43 @ | .45 |
| Beutene | lb. | .59 @ | .64 |
| B-J-F | lb. | .38 @ | .43 |
| Butyl Zimate | lb. | — @ | 1.13 |
| Captax | lb. | .38 @ | .40 |
| Crylene | lb. | .40 @ | .47 |
| Di-Ortho-Tolyguanidine | lb. | .44 @ | .46 |
| Diphenylguanidine | lb. | .35 @ | .36 |
| El-Sixty | lb. | .40 @ | .47 |
| Ethyl Zimate | lb. | — @ | 1.13 |
| Ethylidene aniline | lb. | .42 @ | .43 |
| Formaldehyde aniline | lb. | .31 @ | — |
| Guantal | lb. | .40 @ | .50 |
| Hepteen | lb. | .34 @ | .39 |
| Hexamethylenetetramine | lb. | .33 @ | — |
| Lead Oleate, No. 999 | lb. | .13 @ | — |
| Witco | lb. | .15 @ | — |
| Ledate | lb. | — @ | 1.48 |
| Methyl Tuads | lb. | — @ | 1.53 |
| Methyl Zimate | lb. | — @ | 1.23 |
| Monex | lb. | — @ | 1.53 |
| Pentex | lb. | .74 @ | .84 |
| Phenex | lb. | .50 @ | .55 |
| Pip-Pip | lb. | — @ | 1.65 |
| R & H 50-D | lb. | .42 @ | .43 |
| R-2 | lb. | 1.40 @ | 1.80 |
| R-2 Crystals | lb. | 1.55 @ | 1.70 |
| Rotax | lb. | .48 @ | .50 |
| Safex | lb. | 1.15 @ | 1.25 |
| Selenac | lb. | — @ | 1.98 |
| SPDX | lb. | .70 @ | .75 |
| Super-Sulfur No. 2 | lb. | .13 @ | .15 |
| Thiocarbanilid, drums | lb. | .28 @ | .33 |
| Thiurad | lb. | — @ | 1.55 |
| Trimene | lb. | .54 @ | .64 |
| base | lb. | 1.03 @ | 1.18 |
| Triphenylguanidine | lb. | .45 @ | — |
| Ulto | lb. | 1.25 @ | 1.75 |
| Ureka | lb. | .50 @ | .57 |
| Blend B | lb. | .50 @ | .57 |
| Blend C | lb. | .48 @ | .55 |
| Vulcanex | lb. | .42 @ | .43 |
| Vulcanol | lb. | .85 @ | — |

Inorganic

| | | | |
|---|---|---|---|
| Litharge, domestic | lb. | .07 @ | .07½ |
| Magnesia, calcined, heavy | lb. | .04 @ | — |

### COLORS

Blacks (See Next Column)

| | | | |
|---|---|---|---|
| Blues [b] | | | |
| Prussian | lb. | .36 @ | — |
| Ultramarine | lb. | .17 @ | .27 |
| Browns [b] | | | |
| Mapico | lb. | .1135@ | — |
| Umber, Turkey | lb. | .04¾@ | — |
| Greens [b] | | | |
| Chrome | lb. | — @ | .25 |
| Guignet's Green | lb. | .70 @ | — |
| Reds | | | |
| Antimony crimson, 15/17 | lb. | — @ | — |
| sulfur, free | lb. | — @ | — |
| Indian | lb. | .08¾@ | — |
| Domestic (Maroon) | lb. | .11 @ | — |
| Mapico | lb. | .096 @ | — |
| Red oxide, pure | lb. | .10 @ | .12 |
| Rub-Er-Red | lb. | .09¾@ | — |
| Whites [b] | | | |
| Cryptone No. 19 | lb. | .0560@ | .0585 |
| Cryptone CB No. 21 | lb. | .0560@ | .0585 |
| Cryptone ZS-800 | lb. | .0825@ | .0850 |
| Lithopone: | | | |
| Albalith | lb. | .04¼@ | .04½ |
| Astrolith | lb. | .04¼@ | .04½ |
| Azolith | lb. | .04¼@ | .04½ |
| Ray-cal | lb. | .05½@ | .05¾ |
| Rayox | lb. | .14½@ | .15¾ |
| Titanox A | lb. | .14½@ | .14¾ |
| Titanox B | lb. | .05¾@ | .06 |
| Titanox C | lb. | .05½@ | .05¾ |
| Zinc Oxide—American Process [b] | | | |
| American Azo: ZZZ (lead free) | lb. | .07¼@ | .07½ |
| Anaconda, lead free | lb. | .07¼@ | .07½ |
| Horsehead Lead Free Brand: | | | |
| Special—3 | lb. | .07¼@ | .07½ |
| XX Red—4 | lb. | .07¼@ | .07½ |
| XX Red—72 | lb. | .07¼@ | .07½ |
| XX Red—103 | lb. | .07¼@ | .07½ |
| Kadox, black label—15 | lb. | .07¼@ | .07½ |
| Red label—17 | lb. | .07¼@ | .07½ |
| St. Joe, black label | lb. | .07¼@ | .07½ |
| green label | lb. | .07¼@ | .07½ |
| red label | lb. | .07¼@ | .07½ |
| U. S. P.—7, bbls. | lb. | .10½@ | .10¾ |
| Zinc Oxide—French Process: [b] | | | |
| Florence White Seal—7 bbl. | lb. | .09½@ | .09¾ |
| Green seal—8 | lb. | .09 @ | .09¼ |
| Red seal—9 | lb. | .08½@ | .08¾ |
| Yellows [b] | | | |
| Cadmolith | lb. | .55 @ | .60 |
| Chrome | lb. | — @ | .50 |
| Mapico | lb. | .071 @ | — |

### BLACKS
(In bags, carload lots)

| | | | |
|---|---|---|---|
| Aerfloted Arrow | | .0355@ | — |
| Certified | | .0355@ | — |
| Certified Spheron | | .0355@ | — |
| Channel "S" | | .12 @ | — |
| Continental | | .0355@ | — |
| Disperso | | .0355@ | — |
| Dixiedensed | | .0355@ | — |
| Dixiedensed 66 | | .0355@ | — |
| Excello | | .0355@ | — |
| Furnex | | .03½@ | .06 |
| Furnex Beads | | .03½@ | .06 |
| Gastex | | .03½@ | .06 |
| Kosmobile | | .0355@ | — |
| Kosmobile 66 | | .0355@ | — |
| Kosmos-Dixie 20 | lb. | .03½@ | .06 |
| Micronex (Amarillo) | | .0355@ | — |
| Micronex Beads (Amarillo) | | .0355@ | — |
| Pelletex | | .03½@ | .06 |
| P-33 | | .0475@ | — |
| Shell Carbon (Del. Midwest) | | .025 @ | — |
| Supreme | | .0355@ | — |
| Thermax | | .0225@ | — |
| Thermax "S" | | .0675@ | — |
| Wyex | | .0355@ | — |

### COMPOUNDING MATERIALS

| | | | |
|---|---|---|---|
| Aluminum Flake | ton | 18.00 | @24.50 |
| 99½%-300 | ton | — | @16.50 |
| 86-90%-300 | ton | — | @13.50 |
| Asbestine | ton | 16.50 | @20.00 |
| Barium carbonate (98-100%) | ton | 47.00 | @49.00 |
| Barytes | ton | 25.35 | @36.00 |
| Bentonite | ton | 11.00 | @16.00 |
| Blanc fixe, dry | ton | 60.00 | @67.50 |
| Calcene | ton | 37.50 | @43.00 |
| Catalpo (fact.) | lb. | .02 @ | — |
| Chalk, precipitated | | | |
| Suprex white | ton | 32.50 | @45.00 |
| Clay, Aerfloted, Suprex | ton | 10.00 | @22.50 |
| Aerfloted Paragon | ton | 10.00 | @22.50 |
| Crown (f.o.b. plant) | ton | 11.00 | @ — |
| Dixie | ton | — | @10.00 |
| Langford | ton | — | @ 8.50 |
| McNamee | ton | — | @10.00 |
| Par | ton | — | @10.00 |
| Witco | ton | 10.00 | @ — |
| Cotton Flock (Dark) | lb. | .10½@ | .13 |
| Kalite No. 1 | ton | — | @26.00 |
| Kalite No. 3 | ton | — | @36.00 |
| Kalvan | ton | — | @100.00 |
| Kalvan "S" | lb. | — @ | .09½ |
| Magnesium carbonate | lb. | .06¼@ | — |
| Mica | ton | 35.00 | @44.00 |
| Mineralite | ton | — | @30.00 |
| Pyrax A | ton | — | @ 7.50 |
| Rottenstone (powd. Dom.) | ton | 25.50 | @37.50 |
| Rubberol | lb. | — @ | .17½ |
| Silene (calcium silicate) | lb. | .04 @ | .045 |
| Starch, powdered | cwt. | 2.90 @ | 4.10 |
| Talc, domestic | ton | 17.00 | @25.00 |
| Whiting, commercial | ton | 16.00 | @26.00 |
| Columbia Filler | ton | 9.00 | @14.00 |
| Witco | ton | 6.00 @ | — |
| Wood Flour (100 mesh) | ton | 30.00 | @32.00 |

### MINERAL RUBBER

| | | | |
|---|---|---|---|
| 285°-300° Mineral Rubber | ton | 25.00 @ | — |
| Black Diamond | ton | 25.00 @ | — |
| Genasco, solid (factory) | ton | — @ | — |
| Hard Hydrocarbon | ton | 25.00 @ | 27.00 |
| MilliMar | lb. | — @ | .05½ |
| Parmr, solid | ton | — @ | — |
| Pioneer, MR, solid | ton | — @ | — |

### MISCELLANEOUS

| | | | |
|---|---|---|---|
| Aromatics—Rodo #0 | lb. | 4.00 @ | 4.50 |
| Rodo #10 | lb. | 5.00 @ | 5.50 |
| Curodex 19 | lb. | 2.75 @ | — |
| Curodex 188 | lb. | 3.50 @ | — |
| Curodex 198 | lb. | 4.50 @ | — |
| Para-Dors | lb. | 4.50 @ | — |
| Aresklene No. 375 | lb. | .35 @ | .50 |
| Darvan (dispersing agent) | lb. | .30 @ | .34 |
| Santomerse S | lb. | .11 @ | .25 |
| Sponge Paste | lb. | — @ | .18 |
| Sunproof | lb. | .22¾@ | .27¾ |
| Tackol (tackifier) | lb. | .085 @ | .18 |
| Tonox | lb. | .50 @ | .59 |
| Ty-Ply | gal. | 6.75 @ | 8.00 |
| Unicel (blowing agent) | lb. | .50 @ | — |

### SOFTENERS

| | | | |
|---|---|---|---|
| Acids | | | |
| Acetic, 28%, bbls. [a] | 100 lb. | 3.38 @ | 3.63 |
| Nitric, 36 degrees | cwt. | 5.00 @ | — |
| Acids, Fatty | | | |
| Laurex | lb. | .14¾@ | .17¼ |
| SL #10 | lb. | .12 @ | .14 |
| Stearex Beads | lb. | .10 @ | .11 |
| Stearite | lb. | .10 @ | — |
| Alkalies | | | |
| Caustic Soda, 76% | cwt. | 2.70 @ | 5.70 |
| Soda Ash, 58% | cwt. | 1.15 @ | 2.98 |
| Oils | | | |
| Cycline Oil | gal. | .14 @ | .20 |
| Degras, bbls. | lb. | .11 @ | .12½ |
| Para-Flux | gal. | .17 @ | .18 |
| Para-Lube | lb. | .046 @ | .048 |
| Petrolatum, amber [b] | lb. | .03¼@ | .04½ |
| Pigmentaroil, tank cars | gal. | .20½@ | — |
| in drums | gal. | .26½@ | .27½ |
| Pine, tanks | gal. | .55 @ | — |
| Rosin Oil, cmpd. | gal. | .40 @ | — |
| Rubberol | lb. | .13½@ | .14 |
| Rubtack | lb. | .10 @ | — |
| Seedine, c.l. | lb. | .07¼@ | — |
| Tackol | lb. | .08½@ | .18 |
| Witco Palm Oil | | — @ | — |
| Witco Softener No. 20 | gal. | .20 @ | — |
| Woburn No. 8, c.l. | lb. | .06 @ | — |
| Resins and Pitches | | | |
| Pitch, Burgundy | lb. | .06 @ | — |
| coal tar | ton | 19.00 | @22.00 |
| hardwood | ton | 16 00 | @22.50 |
| pine, 200 lb. gr. wt. | bbl. | — @ | 4.50 |
| Pigmentar, tank cars | gal. | .20½@ | — |
| in drums | gal. | .26½@ | .27½ |
| Retort Pine Tar, drums | gal. | .26½@ | .27½ |
| Solvents | | | |
| Acetone, pure [a] | lb. | .07 @ | — |
| Benzene, 90%, tank car | gal. | .14 @ | — |
| Beta-Trichlorethane | gal. | — @ | .20 |
| Bondogen | lb. | .98 @ | 1.05 |
| Carbon, bisulfide | lb. | .05 @ | .08½ |
| Carbon tetrachloride | gal. | .73 @ | 1.27 |
| Dichlorethylene | lb. | — @ | — |
| Dipentene, cml., drums | gal. | .48 @ | .50 |
| Ethylene dichloride | lb. | .07½@ | .08½ |
| Plastogen | lb. | .07¾@ | .08 |
| Reogen (drums) | lb. | .11½@ | .12 |
| Rub-Sol | gal. | .09½@ | — |
| Trichlorethylene | lb. | .08 @ | .09½ |
| Turpentine, spirits | lb. | .78½@ | — |
| dest. dist., drums | gal. | .50 @ | .55 |
| Waxes | | | |
| Beeswax, white [b] | lb. | .61 @ | — |
| Carnauba, yellow [b] | lb. | .87 @ | .89 |
| Ceresin, white, dom. | lb. | .13½@ | .15 |
| Montan, crude | lb. | .45 @ | .46 |
| Paraffin [a] | | | |
| Yellow crude scale, 124/126 | lb. | .04¼@ | — |
| Refined, 123/125 | lb. | .05¼@ | — |

### ANTI-OXIDANTS

| | | | |
|---|---|---|---|
| Agerite Alba | lb. | 1.95 @ | 2.05 |
| Gel | lb. | .52 @ | .54 |
| Hipar | lb. | .61 @ | .63 |
| Powder | lb. | .43 @ | .45 |
| Resin | lb. | .43 @ | .45 |
| Resin D | lb. | .43 @ | .45 |
| White | lb. | 1.23 @ | 1.33 |
| Albasan | lb. | .69 @ | .74 |
| Antox | lb. | .54 @ | .56 |
| B-L-E | lb. | .43 @ | .52 |
| Flectol H | lb. | .52 @ | .65 |
| Flectol White | lb. | .90 @ | 1.15 |
| Neozone A, B, C, D, E | lb. | .43 @ | .63 |
| Oxynone | lb. | .77 @ | .90 |
| Retardex | lb. | .45 @ | .48 |
| Santoflex B | lb. | .52 @ | .65 |
| Santovar A | lb. | 1.15 @ | 1.40 |
| S.C.R. | lb. | .33 @ | .35 |
| Stabilite | lb. | .52 @ | .54 |
| Stabilite Alba | lb. | .70 @ | .75 |
| VGB | lb. | .43 @ | .52 |

### EXTENDERS

| | | | |
|---|---|---|---|
| Naftolen | lb. | .15 @ | .25 |
| Vanzak | gal. | .05 @ | .06 |

### LUBRICANTS—MOLD & RUBBER SURFACE

| | | | |
|---|---|---|---|
| Aresklene | lb. | .35 @ | .50 |
| Cocoa Soapstock | lb. | .06 @ | .08 |
| Colite | gal. | .90 @ | 1.15 |
| Dipex | lb. | .06 @ | .08 |
| Glycerized Liquid Lubricant | gal. | — @ | 1.35 |
| Lubrex | lb. | .25 @ | .30 |
| Mineralite | ton | — @ | 30.00 |
| Mold Paste | lb. | .12 @ | .18 |
| Sericite | ton | 65.00 @ | 75.00 |
| Soap Tree Bark, cut, sifted | lb. | .06 @ | .08 |

### FACTICE OR RUBBER SUBSTITUTES

| | | | |
|---|---|---|---|
| Amberex | lb. | .25 @ | — |
| Amberex Type B | lb. | .18¾@ | — |
| Black | lb. | .08½@ | .13 |
| White | lb. | .09 @ | .15 |
| Brown | lb. | .10 @ | .14 |
| Neophax A | lb. | .16½@ | — |

### VULCANIZING INGREDIENTS

| | | | |
|---|---|---|---|
| Dispersed Sulfur No. 2 | lb. | .08 @ | .12 |
| Sulfur Chloride, yellow (drs.) | lb. | .03 @ | .08 |
| Sulfur, rubber makers | | | |
| Refined (bags) | cwt. | 2.55 @ | — |
| Commercial (bags) | cwt. | 2.20 @ | — |
| Telloy | lb. | 1.75 @ | — |
| Vandex | lb. | 1.75 @ | — |

[a] Price Ceilings.
[b] Price Suggestions or Agreements.

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Industry.

# The Market Place

If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

## Chemicals and Compounding Materials


ACCELERATOR Z 51
- Good Aging Properties
- Free from Rapid Overcure
- Safe Processing Properties
- Low Dosages for Optimum Cures

**Advance Solvents & Chem. Corp.**
**245 Fifth Ave. New York, N. Y.**

ACCELERATORS—
El-Sixty; Ureka; Ureka C; Guantal; Santocure; DPG; Pip Pip; A-10; A-32; A-46; A-100; R-2 Crystals • ANTIOXIDANTS—Flectol H, White; Santoflex B, BX; Santovar A.
MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron, Ohio

AERO BRAND
RUBBER CHEMICALS
DPG—DOTG—Accelerator 49
Rubber Sulphur
American Cyanamid & Chemical Corporation
30 Rockefeller Plaza, New York, N. Y.

ALUMINUM FLAKE
A uniform, fine, low gravity, white reinforcing pigment. *Furnished to the rubber trade for 40 years.*
The Aluminum Flake Co.
Akron, Ohio

ALUMINUM HYDRATES
"Alorco" Hydrated Aluminas reinforcing pigments give many desirable properties to rubber. Send for sample.
**ALUMINUM CO. OF AMERICA**
**1970 Gulf Bldg. Pittsburgh, Pa.**

ANTIMONY Pentasulphide, golden and crimson, very fine, pure.
Rare Metal Products Co.
Belleville, N. J.
Direct Factory Representation

CALCENE—The Ideal low gravity, white reinforcing pigment. Gives high tensile and elongation properties with exceptionally good resistance to tear and abrasion.
PITTSBURGH PLATE GLASS CO.,
COLUMBIA CHEMICAL DIV.
Grant Bldg., Pittsburgh, Pa.

CARBON BLACK-MICRONEX
The world's standard gas black; universally known as the "King of Rubber Pigments."
BINNEY & SMITH CO.
41 East 42nd St. New York City

CARBON BLACK
CONTINENTAL
The Newest Name in Carbon Black offers
CONTINENTAL DUSTLESS
CONTINENTAL COMPRESSED
CONTINENTAL UNCOMPRESSED
Continental Carbon Company
295 Madison Ave., New York, N.Y.

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and DUSTLESS and a
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Standard Since 1890
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Resinous Oils
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# The Market Place

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## Chemicals and Compounding Materials (continued)

COLLOIDAL SULPHUR
COLLOIDAL ZINC OXIDE
COLLOIDAL COLORS
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Soapstone
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RUBBER CHEMICALS DIVISION
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"Galex" — a non-oxidizing Resin
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## Chemicals and Compounding Materials {continued}

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STEAREX BEADS
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